

# Polyzoa

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## Förord till den elektroniska utgåvan

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DEN NORSKE NORDHAV S- EXPEDITION

1876 — 1878.

XXVII.

ZOOLOGI.

P O L Y Z O Å.

VED

0. NORDGAARD.

MED 1 PLANCHE OG 1 KART.

CHRISTIANE

GRØNDAHL & SØNS BOGTRYKKERI. 1900.

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CHRISTIANIA.

GRØNDAHL & SØNS BOGTRYKKERI. 1900.THE NORWEGIAN NORTH-ATLANTIC EXPEDITION

18 7 6—1878.

ZOOLOGY.

P O L I Z O A.

BY

0. NORDGAARD.

WITH 1 PLATE AND 1 MAP.

CHRISTIANIA.

PRINTED BY GRØNDAHL & SØN. 1900.1 det toldende liar jeg leveret en systematisk fortegnelse over ile

polyzoer, som indsamledes under Nord-liavsexpeditionen. Forat der ikke skal reises tvil om hvilke former, jeg har ment. er der angivet etpar steder, hvor der findes en ordentlig beskrivelse af arten. I regelen har jeg henvist til Smitt og Hincks. Tallene i ( ) refererer sig til literat il rfortegnelsen.

I have liere given a systematic list of the Polyzoa collected during the North Atlantic Expedition. In order that there shall lie no doubt as to which forms I have meant, two or three places are mentioned where a proper description of the species is to be found. I have generally referred to Smitt, and Hincks. The ligures in brackets refer to the Bibliography.

Bergen, oktober, IS!)!).

Bugen. October, IS!)!).iC heil o st o mat a.

Cheilosto m a t a

Fain. Eucratidae.

Gen. Gemellaria.

Gemellaria loricata, Linn.

Smitt, (24. III), p. 286, 324, tab. 17, fig. 54. Hincks, (8), p. 18. tab. 3, fig. 1—4.

Findesteder. St. 315, 322, 343, 363, Spitsbergen.

Arten har stor udbredelse paa grundt vand i arktiske farvand. Den er saaledes tagen paa begge sider af det amerikanske kontinent, er karakteristisk for de grunde sund i Finmarken og forekommer ogsaa i mængde og frodig udvikling ved den finmarkske luivkyst, f. eks. ved Nordkap og Nordkyn.

Fam. Eucratidæ.

Gen. Gemellaria.

Gemellaria loricata, Linn.

Smitt (24, III), pp. 286, 324; Pl. XVII. fig. 54. Hincks (8), p. 18; Pl. III. figs. 1—4.

Occurrence. St. 315, 322, 343, 363, Spitsbergen.

This species has a wide distribution in shallow water in the arctic seas. It was taken, for instance, on both sides of the American continent, is characteristic of the shallow sounds in Finmark, and occurs also in quantities, and in a statu of vigorous development on the Finmark coast, e. g. at the North Cape and at Nordkyn.

Fain. Cellulariidae.

Gen. Menipea.

Menipea ternata, Ell. et Sol.

Cellularia ternata, Smitt, (24, III), p. 282, 3U5, tab. 16, fig. 10 — 20.

Menipea ternata, Hincks, (8). p. 38, tab. 6, fig. 1—4.

Findesteder. Kjosén, St. 223, Peeren Eiland, Spitsbergen.

Ligesom foregaaende er denne ogsaa en af de almindeligste arktiske polyzoer. De forskjellige arter, som er opstillede inden Smitts Cellularia ier«aia-gruppe, bor vistnok rettest opfattes som varieteter.

Fam. Cellulariidæ.

Gen. Menipea.

Menipea ternata, Ell. & Sol.

Cellularia ternata, Smitt (24, III), pp. 282, 305; Pl. XVI, figs. 10—26.

*Menipea ternata*, Hincks (S), p. 38; Pl. VI. figs. 1—4.

Occurrence. Kjosén, St. 223, Bear Island, Spitsbergen.

This, like the preceding species, is one of the commonest arctic Polyzoa. The various species which have been set up in Smitt's Cellularia ternata group, ought more properly to be regarded as varieties.<sup>4</sup>

*Menipea jeffreysii*, Norman.

Hincks, (8), p. 42, tab. 9, fig. 1. 2. Norman, (17, vol. 12). p. 44G, tab. 19, fig. 1. Nordpaa rd. (18, I), p. 11, tab. 2. fig. 5.

Findesteder. St. 10, 18.

Arten er tagen hist og her langs Norges kyst fra Bergen til Østfinnmarken; er forøvrigt kun kjendt fra Shetland. Jeg har i de to sidste aar fundet den flere gange i fjordene ved Bergen. Alle de eksemplarer, jeg har seet, har været forsynede med det eiendommelige kitinøse støtteapparat.

*Menipea jeffreysii*, Norman.

Hincks (8), p. 42: Pl. IX, figs. 1, 2. Norman (17, Vol. 12), p. 446; Pl. XIX, fig. 1. Nordgaard (18, I), p. 11; Pl. II. fig. 5.

Occurrence. St. 10, 18.

This species is found here and there along the coast of Norway from Bergen to East Finmark. Otherwise it is only known from the Shetland Isles. During the last two years, I have found it several times in the fjords round Bergen. All the specimens I have seen, have been furnished with the peculiar, chitinous case.

*Menipea normani*, n. sp.\*).

Tab. I, figs. 2—8.

Findesteder. St. 81, 200, 323.

Jeg har vistnok ikke havt tilstrækkelig litteratur til at gjøre mig bekendt med alle menipea-arter, som er opført i Jelley's katalog, men da jeg tror, det er overveieende sandsynlighed for, at den *Menipea*, jeg har havt mellem hænder, er ny og ubeskreven, vil jeg her i korthed karakterisere den.

Zoariet udspringer fra en enkelt stamme, som er sammensat af kitintuber, og hvis nedre ende er fæstet til en sniaasten eller lignende. Grenene er dikotomisk delte og ligger ikke alle i samme plan. De er støttede af kitintuber, som næsten udelukkende forløber efter bagsiden. Zoöciene er forlængede og ordnede i en dobbeltrække. Munden oval og niundingsranden noget ophøiet. Ved den distale rand sidder 3 5 børster eller pigger. Disse kan paa de ypperste zoöeier i grenene have en længde af 0.8 1.0 mm.

Der er to slags avicularier. De laterale er ganske smaa, og de sidder saa langt bagud, at de tildels ikke sees, naar grenen ligger i frontstilling. Derimod rager front-aviculariet, som er fæstet lige under den proximale niundingsrand, langt frem over munden. Den lille mandibel, som sidder i toppen, er rettet nedad. Oöciernes længde er større end bredden, paa mange forekommer bugtede fortykkelser i frontvæggen. Til operculum saaes ikke spor af antydning. Kolonierne var ikke saa godt konserverede, at noget sikkert kan siges om polypidet.

De oven omtalte kitintuber udspringer fra den nederste del af zoöciene, hvorefter de forløber efter zoöciernes bagside for tilslut at samle sig i en enkelt stamme, som saaledes bestaar af en bundt af kitinrør. I dette stykke er der altsaa stor overensstemmelse mellem *M. jeffreysii* og

\*) Opkaldt efter the Rev. Canon Norman, som har leveret store bidrag til udforskningen af vor marine fauna.

*Menipea normani*, n. sp.\*).

Pl I, figs. 2—8.

Occurrence. St. 31. 200, 323.

My knowledge of the literature on this subject is not sufficient to have made me acquainted with all the *Menipea* species that appear in Jelley's catalogue; but as I think there is every probability that the *Menipea* I have had in my hands is new and hitherto undescribed. I will here briefly characterise it.

The zoarium springs from a single stem which is composed of chitinous tubes, and whose lower end is attached to a small stone or something similar. The branches are dichotomous, and do not all lie in the same plane. They are supported by chitinous tubes, which run almost exclusively along the posterior side. The zooecia are elongated, and arranged in a double row. The mouth is oval, and its edges somewhat elevated. On the distal margin there are from 3 to 5 bristles or spines. On the outermost zooecia in the branch, these may be from 0.8 to 1 mm. in length.

There are two kinds of avicularia. The lateral are quite small, and are placed so far back that they sometimes cannot be seen when the branch is viewed from the front. The front avicularium, on the other hand, which is attached just below the proximal margin of the aperture, extends far over the aperture. The little mandible, which is situated at the top, is directed downwards. The length of the oecia is greater than their breadth; in many there are curved expansions of the anterior wall. There is no sign of any operculum. The colonies were not in such a good state of preservation as to allow of anything certain being said about the polypides.

The above-mentioned chitinous tubes spring from the lowest part of the zooecia, and then run along their posterior side, to unite at last in a single stem, which thus consists of a bundle of chitinous tubes. In this respect therefore, there is a great similarity between *M. jeffreysii*

\*) Named after the Rev. Dr. Norman, who has made large contributions to the knowledge of our marine fauna. *M. normani*\*). Man ser ogsaa, tildels, at en kitintube forløber langs en bifurkation paa samme maade, som fremstillet af Norman (Notes 011 rare British Polyzoa, Quarterly Journ. Mic. 8c., vol. 8, 11. s., tab. 5, fig. (i). Mellem rodtraadene (tubular fibres, radical fibres) hos *il/*, *ternata* og kitintuberne hos de to andre arter er der neppe nogen anden forskjel end, al de hos den første udspringer under en ret vinkel, mens de hos *il/*, *normani* udspringer saa spidsvinklet, at de løber efter zoariet. for hvilket tuberne saaledes tjener som et effektivt støtteapparat.

Fra *il/*, *jeffreysii* adskilles min art let ved sine store frontavicularier og manglende operculum.

Det kan have sin interesse at stille sig for øie de naturlige forhold paa de tre steder, hvor arten forekom:

St. 31, 703 111., sandler,  $t = 1^{\circ}\text{U C.}$ , 200, 1134 - ,  $t = -1^{\circ}\text{C.}$ , 323, 408 - ,  $t = 1^{\circ}\text{C.}$  -

Den er saaledes hentet op fra et dyb af 1154 meter med iskoldt vand. og sammen med *Kinetoskias arborescens* deler den æren af at have levet i en afstand fra sjøens overflade som er større end 1000 meter.

Koloniernes længde 3 6.r> cm.

Zoöciennindingens længde 0.3 111111.

bredde 0.14 ,,

Frontaviculariets længde 0.24—0.3 ,, Kitintubernes tykkelse 0.001 - 0.002 ..

and *M. normani*\*). A chitinous tube may also sometimes be seen running along a bifurcation in the way described by Norman (Notes 011 Rare British Polyzoa. Quarterly Journ. Micros. Sci., Vol. 8, 11. s. Pl. V, fig. (i). There is hardly any difference between the radical fibres in *M. tornata*, and the chitinous tubes in the two other species, except that in the first they spring out at right angles, while in *M. jeffreysii* and *il/*, *normani* they spring out at such an acute angle that they follow the zoarium, and thus serve as an effective support.

My species is easily distinguished from *il/*, *jeffreysii* by its large anterior avicularia and the absence of an operculum.

It may be interesting to observe the natural conditions in the three places where the species occurred. These were as follows:

St. 31, depth 703 111., sandy clay, temp. - 1.0« C. ,, 200, ,, 1134 - , clay , ,, 1.0° -,, 323, , 408 - , clay , ,, 1.5° -

It has thus been brought up from a depth of 1134 metres, from ice-cold water; and it shares with *Kinetosida arborescens* the honour of having lived at a distance of more than 1000 metres below the surface of the sea.

Length of colony from 3—0.5 cm.

Length of the aperture 0.3 111111.

Breadth of the ,, 0.14 -

Length of anterior avicularium from 0.24—0.3 Thickness of chitin tubes from 0.03f>- 0.0(i -

Gen. *Scrupocellaria*.

*Scrupocellaria reptans*, Liim.

Cell »lar ia reptans, Smitt, (24. III), p. 284, 318, tab. 17, fig. 37 -41.

*Scrupocellaria reptans*. Hincks, (8)- p. 52, tab. 7, fig. 1 7. Findested. Brandø Sund.

Denne art vides ikke med sikkerhed at være observeret i den arktiske del af vort land. M. Sars (22) opfører vistnok *Collularia reptans* som almindeligt forekommende i Havø Sund og ved Hammerfest, men det foreligger sandsynligvis her en forveksling med *Menipea ternata*. Både Norman og jeg har taget arten i Trondhjemsfjorden, men nordenfor er den endnu ikke funden.

Gen. *Scrupocellaria*.

*Scrupocellaria reptans*, Linn.

*CelMaria reptans*, Smitt (24, III), pp. 284, 318; Pl. XVII, figs. 37—41.

*Scrupocellaria reptans*, Hincks (8), p. 52; Pl. VII. figs. 1 7. Occurrence. Brandø Sund.

This species is not known with certainty to have been observed in the arctic portion of Norway. M. Sars (22), indeed, specifies *Celhlaria reptans* as of common occurrence in Havø Sund and at Hammerfest; but this is probably through confounding it with *Menipea ternata*. Both Norman and I have found the species in the Trondhjem Fjord, but farther north it has not yet been found.

\*) .1 min fortegnelse har jeg tydet disse kitintuber som hydroid-rør (18, II. p. 11, tab. 2, fig. fi). Dette er nok ikke rigtigt. Vistnok finder man ofte ogsaa ledsagende liydroider saaledes som angivet paa min oven citerede figur, men de egentlige kitintuber udspringer baade hos *M. normani* og *M. jeffreysii* fra zoöicernes nederste parti, og de maa saaledes kunne opfattes som svarende til rodtraadene hos *M. ternata*.

\*) In my list, I have interpreted these chitinous tubes as hydroid tubes (18, II, p. 11; Pl. II, fig. ,r>). This is not, correct,. It is true that accompanying hydroids are often found as represented in my above-mentioned figure; but the true chitin tubes, both in *M. normani* and *M. jeffreysii*, spring from the lowest portion of the zoieeia, and might thus be supposed to answer to the root fibres in *M. ternata*.

Fam. *Bicellariidae*.

Gen. *Bicellaria*.

*Bicellaria alderi*. Busk.

Smitt (24, III), p. 289, 335, tab 18, fig. 4—8. Hincks (8), p. 70, tab. 9, fig. 3—7.

Findesteder. St. 10. 315.

Levensen (14) opfører ikke den form for Danmark, men ifølge Hincks er den tagen ved Shetland, og i Norge har jeg observeret arten paa forskellige steder fra Bergen til Lofoten. Den er hidtil ikke omtalt fra arktiske egne, og

naar saaledes arten pludselig viser sig saa langt mod nord som paa St. 315 (74° 53' X. B.). maa denne omstændighed vistnok kunne anføres som et eksempel paa Golfstrømmens evne til at Hytte boreale former mod øiere breddegrader.

Anm. I min fortegnelse over norske CJwilostomata (18, I) har jeg opført *Bicellaria ciliata*, Linn. som funden af M. Sars i Kristianiafjorden. Jeg har senere taget denne vakre form paa *Bicellaria alderi* i Hjeltefjorden, og arten kan saaledes med sikkerhed opføres som hørende til Norges fauna.

Gen. Bugula.

*Bugula murrayana*, Johnst.

Smitt (24, III), p. 291, 349, tal>. 18, fig. 19—27. Hincks (8), p. 92, tab. 14. fig. 2—9.

Findesteder. St. 260, 322, Spitsbergen.

Var. *fruticosa*, Pack, Advent Bay. Var. *quadridentata*, Lov., St. 10, 18, 2(52. 315.

I arktiske farvand synes varieteterne at være almindeligere end den typiske form.

*Bugula purpureotincta*, Norman. Hincks (8), p. 89, tab. 12, fig. 8 12. Findested Kjosen.

Arten er funden paa forskellige steder langs Skandinaviens kyst, men den nordligste hidtil kjendte forekomst er Kjosen. Jeg tog den vinteren 1899 i Malangenfjord fastvokset til en hydroid (100-200 m.).

Kam. *Bicellaridæ*.

Gen. *Bicellaria*.

*Bicellaria alderi*. Busk.

Smitt (24, III), pp. 289, 335; Pl. XVIII, figs. 4 8. Hincks (8), p. 70; Pl. IX, figs. 3 7.

Occurrence. St. 10, 315.

Levensen (14) does not give this form for Denmark, but according to Hincks it is found in the Shetland Isles, and I have observed the species in Norway in several places from Bergen to Lofoten. It has not yet been reported from arctic regions; and when the species thus suddenly appears so far north as St. 315 (74° 53' JST. Lat.), the circumstance might certainly be quoted as an instance of the power of the Gulf Stream to carry boreal forms up into higher latitudes.

Remark. In my list of Norwegian Cheilostomata (18. I), I have entered *Bicellaria ciliata*. Linn, as found by M. Sars in the Kristiania Fjord. I have since found this beautiful form on *Bicellaria alderi* in Hjeltefjorden; and the species may thus safely be put down as belonging to the fauna of Norway.

Gen. Bugula. *Bugula murrayana*, Johnst.

Smitt (24, III), pp. 291, 349; Pl. XVIII, figs. 19 27. Hincks (8), p. 92; Pl. XIV, figs. 2 9.

Occurrence. St. 200, 322, Spitsbergen;

Var. *fruticosa*, Pack, Advent Bay; Var. *quadridentata*, Lov, St. 10, 18, 262, 315.

In arctic waters, the varieties seem to be more general than the typical form.

*Bugula purpureotincta*, Norman. Hincks (8), p. 89; Pl. XII, figs. 8-12. Occurrence. Kjosen.

This species is found in various places along the coast of Scandinavia; but the most northerly place at which it has hitherto been known to occur is Kjosen. I found it at the beginning of 1899 in Malangenfjord, grown fast to a hydroid (100 200 in.). (len. *Kinetoskias*.

Gen. *Kinetoskias*.

*Kinetoskias smittii*, Koren et Dan. Koren et Danielsen (13). p. 104, tal). 3, fig. 12 — 14, tab. 12. fig. 4 -8.

Norman (17. vol. 12), p. 448, tab. 19, fig. 2—4; vol. 13, p. 112.

Denne art forekom vistnok ikke blandt Nordhavseks-peditionens materiale, men jeg tager den med her alligevel, fordi jeg vinteren 1899 tog den blandt andre steder ogsaa i den indre del af Vestfjorden, som gik ind under ekspeditionens undersøgelsesfelt.

Det har ogsaa sin interesse, at *K. smittii* hører til de polyzoer, som gaar dybest ned.

] Tranødybet (Vestfjorden) tog jeg nemlig 16de Marts 1899 et eksemplar i en dybde af 607 640 m. Arten er funden paa forskellige steder langs den norske fra Kors-fjorden til Slotholmen i Nordland.

*Kinetoskias arborescens*, Koren et Dan. Koren et Dan. (13), p. 107, tab. 12, fig. 9-14. [humla umbelJa, Smitt (24, III), p. 292, 353, tab. 19, fig.

28-31.

Pindesteder. St. 2, 23, 31.

Norman (17, vol. 13) har undersøgt eksemplarer fra Karahavet og St. Lawrence og paa de førstnævnte tillige fundet oöcier, som lignede oöcierne hos den foregaaende art.

*Kinetoskias arborescens* er hidtil kun funden i et eksemplar i Wijde Bay, Spitsbergen, i 40 favnes dyb, lerbund, af prof. Lovén. Dijuiphna-ekspeditionen tog diverse eksemplarer i Karahavet (Levinsen). Danielsen tog etpar ved Vadsø (90 favne, lerbund), endvidere er arten kjendt fra St. Lawrencebugten (Whiteaves). Det er saaledes interessant at kunne konstatere artens tilstedeværelse paa St. 2 (Sognefjorden). Paa dette sted var dybden 1229 meter, hvilket er den største hidtil kjendte sænkning af bunden i nogen norsk fjord. Bunden bestod af sandig ler og temperaturen paa dybet 6°.7 C.

Fam. Cellariidae.

Gen. Cellaria.

*Cellaria fistulosa*. Linn. Smilt (24, III), p. 362, 386, tab. 20, fig. 18 20. Hincks (8), p. 106, tab. 13, fig. 1 4.

Denne art forekom blandt det mig tilstillede materiale, men uden angivelse af findested. Jeg har ellers taget samme paa forskellige steder fra Bergen til Lofoten.

*Kinetoskias smittii*, Koren & Dan. Koren & Danielsen (13). p. 104; Pl. III, figs. 12 14;

Pl. XII, figs. 4 8. Norman (17, Vol. XII), p. 448; Pl. XIX, figs. 2- 5; Vol. 13, p. 112. This species did not, indeed, occur in the North Atlantic Expedition's collection, but I nevertheless include it here, because, among other places, I found it, in the early part of 1899, in the inner part of Vestfjorden, which was included in the Expedition's field of investigation.

It is also of some interest to note that *K. smittii* belongs to those Polyzoa that go deepest.

In Tranødybet (Vestfjord) on the 16th March, 1899,

I took one specimen from a depth of between 607 and 640 metres. The species is found in various places along the Norwegian coast from Korsfjorden to Slotholmen in Nordland.

*Kinetoskias arborescens*, Koren & Dan. Koren & Danielsen (13), p. 107; Pl. XII, figs. 9 14. Bugula nmbelJa, Smitt (24, III), pp. 292, 353; Pl. XIX, figs. 28—31. Occurrence. St. 2, 23, 31.

Norman (17, vol. 13) has examined specimens from the Kara Sea and St. Lawrence, and on the former found oæcia that resembled the oæcia in the preceding species.

Only one specimen of *Kinetoskias arborescens* has hitherto been found in Wijde Bay, Spitsbergen, at a depth of 40 fathoms, clay bottom, by Prof. Lovén. The Djuiphna Expedition found several specimens in the Kara Sea (Levinsen). Danielsen found a few at Vadsø (9(1 fathoms, clay bottom), and the species is further known from the Gulf of St. Lawrence (Whiteaves). It is thus interesting to be able to prove the presence of the species at

Station

2 (Sogne Fjord). The depth here was 1229 metres, which is the greatest depression of the bottom hitherto known in any Norwegian fjord. The bottom consisted of sandy clay, and the temperature there was 6.7° G.

Fain. Cellariidæ.

Gen. Cellaria.

*Cellaria fistulosa*, Linn.

Smitt (24, UT), pp. 362, 386; Pl. XX, figs. 18- 20. Hincks (8), p. 106; Pl. XIII, figs. 1—4.

This species occurred in the collection sent to me, but there was no statement as to where it was found. I have also found the same species in various places between Bergen and Lofoten.<sup>8</sup>

Fain. Fliistridæ.

Gen. Flustra.

*Flustra membranaceo-truncata*. Smitt. Smitt (24. Ill), p. 358, 37(5. tali. 20, fig. 1 5.

Findesteder. St. 2(52. 223 (Jan Mayen).

Donne *Flustra* or tagen paa mange steder i ilen arktiske zone fra Novaja Semlja til Grønland. Hincks (9) opfører deu ogsaa fra Queen Charlotte Islands. Den er ny for Jan Mayen (st. 223). Efter sin forekomst maa denne fonn karakteriseres som en ægte arktisk Vinstra, den er saaledes ikke iagttaget ved Storbritanniens kyst, og er endnu heller ikke funden ved Island.

*Flustra carbacea*, Ell. et Sol.

*Flustra papyrca*. Smitt (34, III), p. 359, 380, tab. 20, fig. 9 11.

*Flustra carbasca*. Hincks (8), p. 123, tab. 1(5. fig. 4, 4a; tab. 14. fig. 1.

Findested. Kjosen (ld 14 favne).

Denne art har ogsaa en stor arktisk udbredelse og findes desuden ved Storbritanniens og Danmarks kyster.

*Flustra abyssicola*. Al. Sars (i. O. Sars (21), p. 19, tab. 2, fig. 25 30.

Findesteder. St. 149 (Vestfjorden), 2(50 (Porsangerfjorden). 290, 323. 3(13.

Siden G. O. Sars fandt denne eiendommelige dyb-vandsflustra ved Guldbraildsøerne og Skroven (Vestfjorden) er den tagen i Gulf of St. Lawrence (Whiteaves) samt i Karahavet (Smitt).

Det største dyb, hvorfra arten blev hentet op paa Nordhavsekspeditionen var 475 ni. (St. 3(53. lerbund, temp. 1°.i C.) og det mindste 247 ni. (St. 149, lerbund, temp. 4°.o C.). Aviculariernes primitive fonn, koloniens rigide beskaffenhed og forekomsten paa store dyb tyder paa, at *F. abyssicola* er senior blandt de nulevende nordlige repræsentanter af slekten *Flustra*.

Kain. Flustridæ.

lien. *Flustra*.

*Flustra membranaceo-truncata*, Smitt. Smitt (24, lill. pp. 358, 37(5; Pl. NX. figs. 1 5.

Occurrence. St. 202, 223 (Jan Mayen).

This *Flustra* was found in many places in the arctic zone from Novaja Semlja to Greenland. Hincks (9) also mentions it from the Queen Charlotte Islands. It is new to Jan Mayen (St. 223). Judging from its occurrence, this fonn must be characterised as a true arctic *Flustra*: it has, for instance, not been observed on the shores of Great Britain, nor has it been found in Iceland.

*Flustra carbacea*. Ell. iV Sol. *Flustra papyrca*, Smitt (34. Ill), pp. 359. 380: Pl. XX,



figs. 9—11.

*Flustra carbasca*. Hincks (8), p. 123; Pl. XVI. figs. 4. 4a; Pl. XIV, fig. I.

Occurrence. Kjosen (10-14 fathoms).

This species also has a wide arctic distribution, and is moreover found on the shores of Great Britain and Denmark.

*Flustra abyssicola*, M. Sars. G. O. Sars (21). p. 19; Pl. 11. figs 25 30.

Occurrence St. 149 (Vestfjorden), 2(50 (Porsangerfjord), 290, 323, 303.

Since G. O. Sars found this peculiar deep-water *Flustra* at the Guldbrand Islands and Skraaven (Vestfjorden), it has been found in the Gulf of St. Lawrence (Whit-eaves) and in the Kara Sea (Smitt).

The greatest depth from which this species was brought up during the North Atlantic Expedition was 475 metres (Station 363, clay bottom, temp. 1.1° C.), and the smallest, 247 m. (St. 149, clay bottom, temp, 4.0° C.). The primitive form of the avicularia, the rigid character of the colony, and its occurrence at great depths, indicate that *F. abyssicola* is one of the oldest among the northern representatives of the genus *Flustra* now in existence.<sup>9</sup>

Fam. Membraniporidae.

Gen. Membranipora. *Membranipora cornigera*. Busk.

*Membranipora flemingii* f. *cornigera*, Smitt (24, III), p. 367, tab. 24, fig. 1.

*Membranipora cornigera*, Hincks (8), p. 164, tab. 21, fig. 4; tab. 22, fig. 3.

Findested. St. 29U.

Hincks (8, p. I(15) angiver kun tre findesteder for denne art, nemlig Shetland, Outer Haaf, off the coast of Norway. Heraf fremgaar, at arten er yderst sparsom i sin forekomst. Ved de gaffeldelte pigger i munden er den saa let kjendelig, at overseen og forveksling ikke godt kan finde sted.

Fam. Membraniporidae.

Gen. Membranipora.

*Membranipora cornigera*, Busk.

*Membranipora flemingii* f. *cornigera*, Smitt (24, III), p. 367

Pl. XXIV. fig. 1. *Membranipora cornigera*, Hincks (8), p. 1(14; Pl. XXI, fig. 4; Pl. XXII, fig. 3.

Occurrence. Station 290.

Hincks (8, p. 165) mentions only three places where this species has been found, viz. Shetland Isles, Outer Haaf. and off the coast of Norway. From this it appears that the species is of extremely rare occurrence. It is so easily recognisable by the forked spines at the mouth, that it could not well be overlooked or mistaken.

*Membranipora arctica*, D'Orb.

*Membranipora lineata* f. *sophiae*, Smitt (24, III), p. 365,

tab. 20, fig. 24, 25. *Membranipora arctica*, Lorenz (1(5), p. 85, tab. 1. fig. 1.

Findested. Norskøenie (Spitsbergen).

Arten dannede et sortagtig overdrag paa snegleskal.

*Membranipora arctica*. D'Orb.

*Membranipora lineata*, /'. *sophiae*, Smitt (24, III), p. 365;

Pl XX, figs. 24, 25. *Membranipora arctica*, Lorenz (16), p. 85; Pl. I, fig. 1.

Occurrence. Norwegian islands (Spitsbergen).

This species formed a blackish coating upon snail-shells.

*Membranipora spitsbergensis*, Smitt,

*Semiflustrdla arctica*, D'Orb. (manuscript). *Membranipora arctica*. Smitt (24, III), p. 367, 413, tab.

20, fig. 33—36. *Membranipora spitsbergensis*, Bidentkap (1), p. 619.

Findested. Norskøerne.

Denne form, soai let kjendes ved sin karakteristiske bagside (Smitt, 1. c., fig. 34) er hidtil kun funden ved Spitsbergen. *Membranipora arctica* har jeg taget paa forskjellige steder i Finmarken, men den er ikke observeret saa langt syd som ved Storbritanniens kyster.

*Membranipora spitsbergensis*, Smitt

*Semiflustrdla arctica*, D'Orb. (manuscript). *Membranipora arctica*, Smitt (24, III), pp. 367, 413; Pl.

XX, figs. 33-36. *Membranipora spitsbergensis*, Bidentkap (1), p. 619.

Occurrence. Norwegian islands.

This form, which is easily recognised by its characteristic back (Smitt, 1. c., fig. 34), has hitherto been found only at Spitsbergen. I have found *Membranipora arctica* in several places in Finmark, but it has not been observed as far south as the shores of Great Britain.

Den norske Nordhavsexpedition. O. Nordgaard: Polyzoa.

olu

Fain. Cribrilinidae.

Gen. Cribrilina.

*Cribrilina punctata*. Hassal.

*Encharipora punctata*. Smitt (24. TV), p. 4, 51. tab. 24. fig. 4 — 7.

*Cribrilina punctata*. Hincks (8), p. 190, tab. 20. fig. 1- 4; tab. 24, fig. 3.

Findesteder. St. 315, 323.

Arten forekommer fra Karahavet til det sydvestlige Frankrig. Jeg har taget denne tilligemed den nærstaaende *C. annulata*, Fabr. paa forskjellige steder langs den norske kyst.

Kam. Cribrilinidæ.

Gen. Cribrilina.

*Cribrilina punctata*, Hassal.

*Excharipora punctata*, Smitt (24. IV), pp. 4. 51; Fl. XXLY. figs. 4—7.

*Cribrilina punctata*. Hincks (8). p. 190; Fl. XXVI. figs. 1-4; Fl. XXIIY., fig. 3.

Occurrence. St. 315, 323.

This species occurs from the Kara Sea to the southwest of France. I have found it together with the nearly-allied *C. annulata*, Fabr. in various places along the coast of Norway.

Fain. Porinidae.

Gen. Tassarodoma.

*Tessaroloma gracile*, M. Sars.

*Anarthropora borcalix*, Smitt (24, iV), p. 8, i>7. tab. 24, fig. 25 29.

*Forinn boreal/s.* Hincks (8), p. 229. tab. 31, fig. 4—6.

Findesteder. Korsfjorden, St. 10, 290, 312.

Udbredt fra Spitsbergen til Portugal, Florida og Azorerne.

Fain. Porinidae.

Gen. *Tessarodoma*.

*Tessarodoma gracile*, M. Sars.

*Anarthropora borealis*, Smitt (24, LY), pp. 8,(57; Pl. XXIV, figs. 25- 29.

*Forma borealis.* Hincks (8). p. 229; Pl. XXXI, figs. 4 li.

Occurrence. Korsfjorden. St. 10, 299. 312.

Extends from Spitsbergen to Portugal. Florida and the Azores.

Fain. *Celleporeilidae*.

Gen. *Celleporella*.

*Celleporella hyalina*, Linn.

*Mollia hyalina*. Smitt (24, IV), p. Hi, 109, tab. 25, fig. 84—85.

*Schizoporella hyalina*, Hincks (8), p. 271, tab. 18, fig. 8—10.

Findesteder. Norskoerne (paa gastropoder). St. 3C>( > (paa alger).

Denne art er meget udbredt i arktiske farvand, og den strækker sig ogsaa langt mod syd, forekommer saaledes ved Australien, Sydafrika, Strait of Magellan, Kalifornien, etc. Den er saaledes i sin optræden en ren kosmopolit.

Fain. *Celleporellidæ*.

Gen. *Celleporella*.

*Celleporella hyalina*, Linn.

*Mollia hyalina*. Smitt (24, IV), pp. 10. 109; Fl. XXV, figs. 84. 85.

*Schizoporella hyalina*. Hincks (8). p. 271; Pl. XVIII, tigs. 8—10.

Occurrence. Norwegian islands (oil gastropods), St. 366 (on algæ).

This species is widely distributed in arctic seas, and it also extends far south, occurring in Australia, South Africa, Straits of Magellan, California, etc. It is thus quite a cosmopolitan in its occurrences.<sup>11</sup>

Fam. Myriozoidæ.

C Jen. *Schizoporella*. *Schizoporella unicornis*. Johnst. forma *ansata*, Hincks.

*Mollia vulgaris* forma *ansata*, Smitt (24, IV), J). 15, tab. 25, fig. 80.

*Schizoporella unicornis* f. *ansata*. Hincks (8), p. 239, tab. 35. fig. 3.

Pindested. St. 312 (paa Myriozoum coarctatum). Nævnte varietet er tagen paa forskellige steder ved Storbritanniens kyster samt af Lovén ved Hammerfest, hvor ogsaa jeg i 1894 fandt den ganske hyppig paa stene. Den er endvidere funden ved Grønland.

Fam. Myriozoidæ.

Gen. *Schizoporella*. *Schizoporella unicornis*, Johnst. forma *ansata*, Hincks.

*Mollia vulgaris* forma *ansata*.<sup>^</sup> Smitt (24, IV), p. 15; Pl. XXV, fig. 80.

*Schizoporella unicornis* f. *ansata*, Hincks (8), p. 239; Pl. XXXV, fig. 3. Occurrence. St. 312 (on *Myrizoum coarctatum*). The above variety has been found in several localities on the shores of Great Britain, and by Lovén at Hammerfest, where I also frequently found it in 1894. on stones. It has moreover been found in Greenland.

Gen. *Myrizoum*.

*Myrizoum crustaceum*, Smitt.

Smitt (24, IV), p. 18, 114, tab. 25. fig. 88 91. *Schizoporella crustacea*, Lorenz (16), p. 87, tab. 7. fig. 2. Findested Norskøerne (Spitsbergen). Denne høiarktiske form (*Matotssehkin* Schiarr, Karahavet, halvøen Kola, Spitsbergen, Jan Mayen, Grønland) er funden i Finmarken. Jeg tog den i 1894 ved Sværholt.

Gen. *Myrizoum*.

*Myrizoum crustaceum*. Smitt.

Smitt (24, IV), pp. 18, 114; Pl. XXV, figs. 88 91. *Schizoporella crustacea*., Lorenz (16), p. 87; Pl. VII, fig. 2. Occurrence. Norwegian islands (Spitsbergen). This high arctic form (*Matotssehkin* Scharr, the Kara Sea, the Kola Peninsula, Spitsbergen, Jan Mayen, Greenland) is also found in Finmark. I found it, in 1894. at Sværholt.

*Myrizoum coarctatum*. M. Sars.

Tab. I, fig. 1. Smitt (24, IV), p. 18. 119, tab. 25, fig. 92,

Findesteder. St. 270, 290, 223, 315, 323. Denne art er ogsaa udpræget arktisk. I Finmarken er den paa sine steder temmelig almindelig, og jeg tog den vinteren 1899 saa langt syd som i Moskenstrømmen, hvilket er det sydligste sted ved den norske kyst, hvor arten har været observeret i dette aarhundrede.

*Myrizoum coarctatum*. M. Sars. pl i, fig-, i.

Smitt (24, IV), pp. 18, 119; Pl. XXV, fig. 92. Occurrence. St. 270, 290, 223, 315, 323. This species is also emphatically arctic. It is rather common in some places in Finmark, and I found it in the beginning of 1899 as far south as Moskenstrømmen, which is the most southerly spot on the Norwegian coast where the species has been observed in the nineteenth century.

Fam. Escharidae.

Gen. *Porella*.

*Porella laevis*, Flem.

Smitt (24, IV), p. 21, 134, tab. 26, fig. 120- 123. Hincks (8), p. 334, tab. 47, fig. 10-11. Findested. St. 18.

Forekommer langs hele den norske vestkyst til Finmarken. Den er ogsaa tagen ved Shetland, Grønland, Spitsbergen, Novaja Semlja, i Karahavet, etc.

Fam. Escharidæ.

Gen. *Porella*.

*Porella laevis*, Flem.

Smitt (24, IV), pp. 21, 134; Pl. XXVI, figs. 120- 123. Hincks (8), p. 334; Pl. XLVII, figs. 10, 11. Occurrence. Station 18.

Occurs all along the Norwegian coast up to Finmark. It has also been found off the Shetland Isles, Greenland, Spitsbergen, Novaja Semlja, in the Kara Sea, etc.<sup>12</sup>

*Porella elegantula*. D'Orb.

*Eschara elegantula*, Smitt (24, IV), p. 24. 154. tab. 26, fig. 140- 146.

*Porella elegantula*. Ridenkap (1). p. 627, tab. 25, fig. 7, 8

Findesteder. St. 270. 223 (Jan Mayen).

Fra Jan Mayen liar Lorenz (16, p. 89, 90) opført 4 arter af slægten *Porella*. nemlig *concinna*, *acutirostris*, *compressa* og *laevis*. Hertil blir nu ogsaa at føje *elegantula*.

Gen. *Escharoides*.

*Escharoides sarsii*, Smitt, Smitt (24. IV), p. 24, 158, tab. 26, fig. 147—154.

Findesteder. Norskøerne, St. 270.

Arten er ren arktisk. Fra Tromsøsundet har jeg seet eksemplarer, som havde en lignende vekstform som *Lepralia foliacea* fra Englands kyst (f. eks. Plymouth sound), idet kolonierne dannede pladeforniigt udbredte og sammenvoksede kavernøse masser. Se forøvrigt M. Sars (23, p. 141 — 144).

Gen. *Smittia*.

*Smittia palmata*, M. Sars.

? *Flustra solida*, Stimpson, *Invertebrata of Grand Manan*.

„ „ Nordgaard (18), p. 15.

*Eschara palmata*, M. Sars (23), p. 146.

„ „ Vigelius (31). p. 15, fig. 2, 3.

*Escharella palmata*, Smitt (24, IV), p. 10, 77, tab. 24, fig. 42—46.

Smitt ^26), p. 21. Smitt (27), p. 29. „ „ Lorenz (Hi), p. 91.

Stuxberg (29), p. 112. „ „ Levinsen (15), p. 14, tab. 27, fig. 3.

*Psmdo-flustra solida*, Bidekap (1), p. 618.

Findesteder. St. 18, 31, 48, 223, 251. 262, 267, 290, 326, 337, 363.

I min fortegnelse over norske poly zoo r opførte jeg Sars's *Eschara palmata* som *Flustra solida*, Stimpson. Jeg havde dengang ikke seet noget eksemplar af arten, og henholdt mig til Jelleys katalog. Imidlertid behøver man ikke at se længe paa den forat finde ud, at den ikke godt kan henføres til slekten *Flustra*, og Bidekap (1), oprettede saaledes en ny slekt (*Pseudo flustra*), hvor arten blev anbragt. Dette kunde visselig forsvares, men jeg liar her foretrukket at opføre den som en *Smittia*, da aviculariets

*Porella elegantula*, D'Orb.

*Eschara elegantula*, Smitt (24, IV), pp. 24, 154; Pl. XXVI, figs. 140 146.

*Porella elegantula*. Bidekap (1), p. ('27; Fl. XXV, figs. 7, 8.

Occurrence. St. 270, 223 (Jan Mayen).

Lorenz (16, pp. 89, 90) has established 4 species of the genus *Porella* from Jan Mayen, viz. *concinna*. *acutirostris*, *compressa* and *laevis*. To these must now also be added *elegantula*.

Gen. *Escharoides*.

*Escharoides sarsii*, Smitt. Smitt (24, IV), pp. 24, 158; Pl. XXVI, figs. 147 154.

Occurrence. Norwegian islands, Station 270.

The species is purely arctic. I have seen specimens from Troinsö Sound, that had a form of growth similar to that of *Lepralia foliacea* from the English coast (e. g. Plymouth Sound), as the colonies form lamellarly expanded and aggregated cavernous masses. See also M. Sars (23. pp. 141 — 144).

Gen. Smittia.

Smittia palmata, M. Sars.

? Flustra solida, Stimpson, Invertebrata of Grand Manan.

„, Nordgaard (18), p. 15.

Eschara palmata, M. Sars (23). p. 146.

„, Vigelius (31), p. 15, figs. 2, 3.

Escharella palmata, Smitt (24, IV), pp. 10, 77; Pl. XXIV, figs. 42—46. Smitt (26), p. 21. Smitt (27), p. 29. „, Lorenz (16), p. 91.

„, Stuxberg (29), p. 112.

Levinsen (15), p. 14; Pl. XXVII,

figs. 3.

Pseudo-flustra solida, Bidentap (1), p. 618.

Occurrence. St, 18, 31, 48, 223, 251, 262. 267, 290. 326, 337. 363.

In my list of Norwegian polyzoans, I entered Sars's *Eschara palmata* as *Flustra solida*, Stimpson. I had not at that time seen any specimens of the species, and had followed Jelley's catalogue. It need not lie looked at long, however, to see that it cannot well be referred to the genus *Flustra*, and Bidentap (1) therefore established a new genus (*Pseudo-flustra*), in which the species was placed. This may be quite justifiable, but I have preferred to enter it as a *Smittia*, as the position and structure of the avicillia and bygonia peger mod nært slektskab. Ældre zoöcier viser tildels temmelig stor lighed med zoöcierne hos *Smittia reticulata*. Da jeg for tiden ikke kan afgjøre, om Stimpson og Sars's arter er identiske, har jeg opført Sars's navn palmat a.

I sin beskrivelse gjorde M. Sars opmærksom paa de bøielige rør af kitinagtig beskaffenhed, som var fæstede til zoarier.

Smitt (24, IV, p. 60), paapegede, at disse rør eller rodtraade (tubular fibres) udgik fra selve zoöcierne og at de nærmede sig hinanden og tilslut voksede sammen til et knippe mod koloniens proximale ende. Ved hjælp af dette knippe var kolonierne fæstede til fremmede legemer paa bunden, saasom ormrør og lignende. Vigelius (31, p. 16) skriver: „They (the branches of the colony) are connected by numerous tubular fibres, originating on both sides of the zoarium from membranous rather pear-shaped envelopes, which cover certain zooecia (fig. 2)". Disse tuber danner merkelig nok et slags forlængelse nedad af zoöcierne, og deres betydning for koloniens liv, maa uden tvivl være at fungere som et støtteapparat, som holder det skjøre zoarium sammen, selv om det brækkes af paa forskellige steder.

cularia indicate a close relationship. Older zoöcia sometimes bear considerable resemblance to the zooecia in *Smittia reticulata*. As I cannot at present decide whether Stimpson's and Sars's species are identical, I have put down Sars's name, palmata.

M. Sars, in his description, drew attention to the flexible tubes of a chitinous consistency, that were attached to the zoarium.

Smitt (24, IV, p. 80) pointed out that these tubes or root-fibres (tubular fibres) issued from the zoöcia themselves, and that they approached one another, and at last grew together into a bunch towards the proximal end of the colony. By means of this bunch, the colonies were attached to foreign bodies at the bottom, such as worm-casts. and the like. Vigelius (31, p. 16) writes: "They [the branches of the colony] are connected by numerous tubular fibres, originating on both sides of the zoarium from membranous, rather pear-shaped envelopes, which cover certain zooecia (fig. 2)". These tubes, strange to say, form a kind of prolongation downwards (if the zoöcia, and their significance to the existence of the colony must without doubt be to act as a

support to keep the brittle zoarium together, even if it be broken in several places.

*Smittia reticulata*, Mac Gill.

*Eschara legentilii*, Smitt (24, IV), p. 10, 81, tab. 24, fig. 47—52.

*Smittia reticulata*, Hincks (8), p. 346, tab. 48, fig. 1—5. Findested. St. 290.

Arten er funden i Karahavet (Levinsen), ved Novaja Senilja (Smitt), Jan Mayen (Lorenz) og opføres ogsaa for Grønland. Men den er ingen arkticus i streng forstand, den forekommer saaledes ved Englands og Frankrigs kyster, i Adriaterhavet, ja endog ved Nyzealand og Falklandsøerne.

*Smittia reticulata*, MacGill.

*Eschara legentilii*, Smitt (24, IV), pp. 10, 81; Pl. XXIV, figs. 47—52.

*Smittia reticulata*, Hincks (8), p. 346; Pl. XLVIII, figs. 1—5.

Occurrence. Station 290.

The species has been found in the Kara Sea (Levinsen), at Novaja Senilja (Smitt), Jan Mayen (Lorenz), and is also recorded from Greenland. But it is not strictly speaking an arctic species, as it occurs on the coasts of England and France, in the Adriatic, and even off New-Zealand and the Falkland Isles.

*Smittia trispinosa*, Johnst.

Tab. I, fig. 'J.

*Eschara jacotini*, Smitt (24, IV), p. 11, 86, tab. 24, fig. 53—57.

*Smittia trispinosa*, Hincks (8), p. 353, tab. 49, fig. 1 — 8. „ „, var. *arborea*, Levinsen (15), p. 16, tab. 27, fig. 7, 8.

Findesteder. St. 273, 326, 357.

Paa de nævnte steder forekom kun den af Levinsen opstillede eiendommelige form *arborea*. Denne varietet er tagen foruden af Dimphna- og Nordhavsekspeditionen ogsaa af Kückenthal og Walter ved Spitsbergen (Bidenkap). Jeg tog den vinteren 1899 i Porsangerfjorden, hvormed den

*Smittia trispinosa*, Johnst.

Pl. 1, fig. 9.

*Eschara jacotini*, Smitt (24, IV), pp. 11, 86; Pl. XXIV, figs. 53—57.

*Smittia trispinosa*, Hincks (8), p. 353; Pl. XLIX, figs. 1—8.

„ „, var. *arborea*, Levinsen (15), p. 16; Pl.

XXVII, figs. 7, 8.

Occurrence. St. 273, 326, 357.

Levinsen's peculiar form *arborea* was the only one that occurred at the above places. This variety has not only been found by the Dimphna and North Atlantic Expeditions, but also by Kückenthal and Walter at Spitsbergen (Bidenkap). I found it in the early part of 1899

ogsaa kan indlemmes i Norges fauna. I den niudderfuldte hulhed af kolonierne fra St. 357 havde annelider og ge-fyreer tildels taget holig.

Gen. *Mucronella*.

*Mucronella abyssicola*, Norman.

Hincks (8), p. 369, tab. 38, fig. 1—2.

Findesteder. St. 48 (paa retepora), 223 (paa myrio-zouvi), 225, 273.

*Mucronella labiata*, Boeck.

*Discopora coccinea* forma *labiata*, Smitt (24, IV). p. 27, 175, tab. 27, fig. 176.

Findesteder. St 270, 290, 315.

Denne art forekommer svært ofte fastvokset til Hor-nera lichenoides.

Begge de sidstnævnte er fundne paa flere steder ved Norgest kyst, *abyssicola* er tagen ved Jan Mayen (Lorenz), og *labiata* opføres fra Kola og Novaja Semlja (Smitt).

*Mucronella coccinea*. Abildg.

*Discopora appensa*, Smitt (24, IV), p. 27, 175, tab. 27, fig. 177.

*Mucronella coccinea*. Hincks (8), p. 371, tab. 34, fig. 1—6. Findested. St, 290.

Udbredt fra Novaja Semlja til Grønland og fra Spitsbergen til England, Frankrig og Adriaterhavet,

*Mucronella sincera*, Smitt.

Tab. I, fig. 13—15.

*Discopora sincera*, Smitt (24, I V), p. 28, 177, tab. 27, fig. 178—180. „ „, Smitt (26), p. 23.

„ „, Smitt (27), p. 30. *Lepralia sincera*, Hincks (10), p. 102, tab. 11, fig. 2. „ „, Lorenz (10), p. 88.

Hennig (7), p. 357. *Hemicschara sincera*, Busk (\*), p. 237. ? *Mucronella preclucida*, Hincks (9), p. 26, tab. 4, fig. 1.

„ „, Hincks (11), p. 225, tab. 15, fig. 3.

*Mucronella sincera*, Nordgaard (18, I), p. 29, tab. 1, fig. 6. „ „, Bidentkap (1), p. 625.

Findesteder. St, 275, 223, 357. \*) Journ. Linnean Soc., Zoo!., vol. 1").

in Porsanger Fjord, which gives it a place among the fauna of Norway. The mud-filled cavities of the colonics from Station 357, were partly inhabited by annelids and geophyreans.

Gen. *Mucronella*.

*Mucronella abyssicola*, Nonnan.

Hincks (8), p. 369; Pl. XXXVIII, figs. 1, 2.

Occurrence. St. 48 (on lietepora), 223 (on Myrio-zouin), 225, 273.

*Mucronella labiata*. Boeck.

*Discopora coccinea* forma *labiata*. Smitt (24, IV), pp. 27, 175; Pl. XXVII, fig. 176.

Occurrence. St. 270, 290, 315.

This species occurs very frequently growing upon Hor-ner a lichenoides.

Both the last-named species are found in several places on the coast of Norway. *Abyssicola* has been found at Jan Mayen (Lorenz), and *labiata* is recorded from the Kola Peninsula and Novaja Semlja (Smitt).

*Mucronella coccinea*, Abildg.

*Discopora appensa*, Smitt (24, IV), pp. 27, 175; Pl. XXVII, fig. 177.

*Mucronella coccinea*, Hincks (8), p. 371; Pl. XXXIV, figs. 1—6.

Occurrence. Station 290.

Distributed from Novaja Semlja to Greenland, and from Spitsbergen to England, France and the Adriatic.



*Mucronella sincera*. Smitt,

Pl. i, figs. i:i—i.iii.

*Discopora sincera*. Smitt (24. IV), pp. 28, 177; Pl. XXVII, figs. 178—180. ,, Smitt (26), p. 23. ,, Smitt (27), p. 30.

*Lepralia sincera*, Hincks (10). p. 102; Pl. XI, fig. 2. ,, ,, Lorenz (16), p. 88.

,, ,, Hennig (7), p. 357.

*Hemieschara sincera*, Busk (\*). p. 237. ? *Mucronella praelucida*, Hincks (9), p. 26; Pl. IV. fig. 1.

Hincks (11), p. 225; Pl. XV, fig. 3. *Mucronella sincera*, Nordgaard (18, I), p. 29; Pl. I, fig. 6. ,, ,, Bidentkap (1), p. 625.

Occurrence. Station 275, 223, 357.

\*) Journ. Linnean Soc., Zool., Vol. XV.15

Ligesom de fleste *mucronella*-arter er ogsaa denne underkastet betydelig variation.

Paa høiarktiske eksemplarer kan zoöciernes naa en usædvanlig størrelse. Paa en koloni fra St. 223 har jeg saaledes maalt:

Zoöciets længde.....1.2 mm.

,, bredde ,.....0.47 -

Mundingens bredde.....0.36

Aviculariets længde fra mandibelledet 0.2

,, bredde.....0.12 -

Lignende maal har jeg taget paa en koloni fra Jøkel-fjord (Kvænangen):

Zoöciets længde .1.0 mm.

,, bredde . . 0.42 -Mundingens bredde . 0.20 -Proximalrandens mucro er meget forskjellig i sin udvikling, og munden kan tildels have et *lepralia*-lignende udseende (fig. 15). Zoöciernes væg er i regelen tydelig perforeret. Derimod kan oöciernes undertiden give indtryk af at være hele (fig. 13), i andre tilfælde er perforeringen paatagelig (fig. 14). Selv hos koloniel' med ganske jevnbrede zoöcier har jeg seet tydelige huller i oöciernes. Oöciernes form er heller ikke konstant, idet ganske kuglerunde kan veksle med ovale. Avicularierne mangler i regelen, og naar de forekommer sidder et dels paa høire side, dels paa venstre side af munden, eller der kan ogsaa optræde et paa hver side (fig. 14). Mandibelen er but, og avicularierne danner som oftest en ret vinkel med zoöciets længderetning. Hincks (9) har leveret en figur af sin art *Mucronella praelucida*, som leder tanken hen paa *sincera*-arten. Af denne sidste har Hincks muligens kun seet 7e)/rt7/«-lignende former (se 10, tab 11. fig. 3), og da var det naturligt at opstille *praelncida* som en egen art, men har man seet i hvilken grad il/, *sincera* kan variere, bliver man tilbøielig til at opfatte *praelncida* som en varietet af denne. „The peculiar projections, placed on each side of the cell-' (Hincks, 11, p. 225) var muligens ikke fuldt udviklede avicularier (se 9, tab. 4, fig. 1). og skulde den formodning være rigtig, faar *praelncida* fra Queen Charlotte Islands en paafaldende lighed med *sincra* fra det nordlige ishav. I ethvertfald er *M. sincera* udbredt fra Novaja Semlja til Grønland, og fra Spitsbergen til Lofoten. Paa mill reise vinteren 1899 tog jeg nemlig en koloni ved Digermulen i Raftsundet.

Like most of the *Mucronella* species, this is subject to considerable variation.

In extreme arctic specimens, the zoecia sometimes attain an unusual size. In one colony, for instance, from Station 223, I have found the following measurements:

Length of zoæcium.....1.2 mm.

Breadth of zoæcium.....0.48 -

Breadth of aperture.....0.36 -

Length of avicularium from mandibular joint . 0.2

Breadth of avicularium.....0.12 -

I have taken similar measurements from a colony from Jøkel Fjord (Kvænangen) :

Length of zoæcium . . 1.0 mm. Breadth of zoæcium . . 0.42 -Breadth of aperture . . 0.29 -The mucro of the proximal margin is very varied in its development, and the mouth has sometimes a *Lepralia*-Wkc appearance (fig. 15). The wall of the zoecia is generally perforated. The oæcia, on the other hand, sometimes give the impression of being entire (fig. 13); in other cases the perforations are evident (fig. 14). Even in colonies with zoecia of equal breadth, I have seen distinct holes in the oæcia. Nor is the shape of the oæcia constant, as quite spherical sometimes alternate with oval. The avicularia are generally wanting, and when they occur, are situated on the right, or the left of the aperture, or one may appear on each side (fig. 14). The mandible is not tapering, and the avicularia are generally at right angles to the longitudinal axis of the zoæcium. Hincks (9) has given a figure of this species *Mucronella prælnida* which recalls the *sincera* species. It is possible that Hincks has only seen forms resembling *Lepralia* (see 10, Pl. II, fig. 3), and it would then be natural to make *prælnida* into a special species; but any one who has seen to what an extent *M. sincera* can vary, will be inclined to look upon *prælnida* as one of its varieties. "The peculiar projections, placed on each side of the cell" (Hincks 11, p. 225), were possibly avicularia that were not fully developed (see 9, Pl. IV, fig. 1); and should this supposition be correct, the *prælnida* from Queen Charlotte Islands acquires a striking resemblance to the *sincera* from the northern polar sea. In any case, *M. sincera* is distributed from Novaja Semlja to Greenland, and from Spitsbergen to Lofoten. While on my journey in the early part of 1899, I found a colony at Digernnilen in Raftsund.

Gen. *Palmicellaria*.

(Jen. *Palmicellaria*.

*Palmicellaria skenei*, Ell. et Sol.

*Eschara skenei* var. *tridens*, Busk (3), p. 33, fig. 3. *Cellepora tridens*, Kirchenpauer (Bryozoa, Die Expedition zur physikalisch-chemischen und biologischen Untersuchung der Nordsee im Sommer 1872, p. 188, fig. a, b).

Findesteder. St. 290. 223, 323, 363.

*Palmicellaria skenei*. Ell. & Sol.

*Eschara skenei* var. *tridens*, Busk (3), p. 33, fig. 3. *Cellepora tridens*, Kirchenpauer (Bryozoa, Die Expedition zur physikalisch-chemischen und biologischen Untersuchung der Nordsee im Sommer 1872, 188, figs. a, b).

Occurrence. St. 290. 223, 323. 363.16

Paa samtlige steder var det Busks varietet, som optraadte. Kirchenpauers beskrivelse er baseret paa et eksemplar taget SV for Bukkenfjordens munding. I min fortegnelse (18, I, j). 26) har jeg opført denne art under navnet *porella skenet*, og de eksemplarer, jeg da havde for mig, lignede nærmest Hincks varietet *bicornis* (8, p. 380, tab. 52, fig. 4).

In all these places it was Busk's variety that appeared. Kirchenpauer's description is based upon a specimen taken at the SW of the mouth of the Bukken Fjord. In my list (18, I, p. 26), I have entered this species under the name of *Porella skenei*; and the specimens I then had before me, most resembled Hinck's variety *bicornis* (8, p. 380; Pl. LII, fig. 4).

Fain. *Celleporidae*.

Gen. *Rhamphostomella*.

*Rhamphostomella costata*. Lorenz. Lorenz (16), p. 94, tab. 7. fig. 11.

Findesteder. St. 262, 273.

Arten er desuden omtalt fra St. Lawrence af Hincks (11, p. 426, tab. 21, fig. 6—8), og er funden af mig i Mehamn i Finmarken. Den er rimeligvis ikke saa sparsom i sin forekomst som man efter dette skulde tro, da den udentvil af enkelte forfattere har været slaaet sammen med *Rhamphostomella* ( *Cellepora*) *scabra*.

Gen. *Cellepora*.

*Cellepora ramulosa*, Linn.

Hincks (8), p. 401, tab. 52, fig. 7—9.

Findested. Korsfjorden, 53 favne.

Er tagen hist og her efter Skandinaviens kyst fra Bohuslän til Finmarken.

*Cellepora incrassata*, Lamarck.

*Celleporaria incrassata*, Smitt (24. IV), p. 33, 198, tab. 28, fig. 212, 213.

*Cellepora cervicornis*. Lorenz (16), p. 95, tab. 1, fig. 12. *Cellepora ventricosa*. Lorenz (16), p. 96, tab. 1, fig. 13.

Findesteder. St. 270, Norskøerne (Spitsbergen).

Arten har stor udbredelse i arktiske have, men gaar ikke saa langt mod syd som til Storbritanien.

Fam. *Celleporidæ*.

Gen. *Rhamphostomella*.

*Rhamphostomella costata*, Lorenz. Lorenz (16), p. 94; Pl. VII, fig. 11. Occurrence. St. 262, 273.

This species is also mentioned from St. Lawrence by Hincks (11, p. 426; Pl. XXI, figs. 6-8), and has been found by me at Mehamn in Finmark. It is probably not so uncommon in its occurrence as this would lead one to believe, as there is no doubt that it has been classed by some authors with *Rhamphostomella* (*Cellepora*) *scabra*.

Gen. *Cellepora*.

*Cellepora ramulosa*, Linn.

Hincks (8), p. 401; Pl. LII, figs. 7—9.

Occurrence. Korsfjord, 53 fathoms.

Is found here and there along the Scandinavian coast from Bohuslän to Finmark.

*Cellepora incrassata*, Lamarck.

*Celleporaria incrassata*, Smitt (24, TV), pp. 33, 198; Pl.

XXVIII, figs. 212, 213. *Cellepora cervicornis*, Lorenz (16), p. 95; Pl. 1, fig. 12. *Cellepora ventricosa*, Lorenz (16), p. 96; Pl. I, fig. 13.

Occurrence. St. 270, Norwegian islands (Spitsbergen).

The species is widely distributed in arctic waters, but does not extend so far south as Great Britain. *o v c l o s t o n i a † a*.

*C y c l o s t o m a t a*

V

Fam. *Crisidae*.

Gen. *Crisia*.

*Crisia eburnea*, Linn.

*Crisia eburnea*, Smitt (24. I) p. 117, 132, tab. 10, fig. 7-19.

Hincks (8), p. 420, tab. 56, fig. 5, 6. *Crisia cornuta*. Smitt (24. I), p. 116, tab. 16, fig. 1.

„Hincks (8). p. 419, tab. 56. fig. 1-4.

Findesteder. St. 31, Brandøssund.

1 tilslutning til Hincks liar jeg i min fortegnelse (18, II) opført formerne *eburnea* og *cornuta* som særskilte arter. Da der imidlertid mellem de to eksisterer overgangsformer, er det kanske rigtigst at benytte *eburnea* som artsnavn og opføre den anden som *forina cornuta*.

*Crisia denticulata*, Lamarck.

Smitt (24, I), p. 117, 137, tab. 16, fig. 20 a, b). Hincks (8), p. 422, tab. 56, fig. 7—9.

Findesteder. St. 10, 164, 223, 262, 273, 323, Porsangerfjord. Spitsbergen.

Denne *crisia* har ogsaa udenfor de arktiske farvand (>n stor udbredelse.

Fam. Crisidæ.

Gen. *Crisia*.

*Crisia eburnea*. Linn.

*Crisia. eburnea*, Smitt (24, I), pp. 117, 132; Pl. XVI, figs. 7—19.

Hincks (8), p. 420; Pl. LVI, figs. 5, 6. *Crisia cornuta*, Smitt (24. I), p. 116: Pl. XVI. fig. 1.

Hincks (8), p. 419; Pl. LVI. figs. 1-4.

Occurrence. Station 31, Brandøssund.

In my list (18. II), I have followed Hincks in entering the forms *eburnea* and *cornuta* as separate species. As transition forms exist, however, between the two, it will perhaps be best to employ *eburnea* as the specific name, and designate the other as *Jonna cornuta*.

*Crisia denticulata*, Lamarck.

Smitt (24, I), pp. 117, 137; Pl. XVI, fig. 20a, b). Hincks (8), p. 422; Pl. LVI, figs. 7—9.

Occurrence. St. 10, 164, 223, 262, 273, 323, Porsanger Fjord, Spitsbergen.

This *Crisia* is also widely distributed outside the arctic seas.

Den norske Nordliavsekspedition. O. Nordgaard: Polyzoa. 18

Fam. Tubuliporidae.

Gen. *Tubulipora*.

*Tubulipora flabellaris*. Fabr.

Smitt (24. II). p. 401, 455, tab. 9. fig. 6—8. Harmer ((i), p. 99, tab. 8, fig. 4.

Findested. St. 366.

Arten er vistnok væsentlig arktisk, men dens udbredelse kan ikke sikkert angives, da den har været forvekslet med andre tubuliporida. Se herom Harmer (ti).

Gen. *Idmonea*.

*idmonea atlantica*. Forbes.

*Tubulipora atlantica*. Smitt (24, II). p. 398, tab. 3, fig.

ti- 7. tab. 4. fig. 4—13. *Idmonea atlantica*. Hincks (8), p. 451, tab. (55, fig. 1—1.

Findesteder. St. 223, 273, 28(5, 290, 323, 363.

Er særlig arktisk i sin forekomst, men ei1 ogsaa ifølge Hincks tagen ved Neapel, Florida. Madeira. .leg har taget arten paa forskjellige steder langs den norske kyst fra Borgen til Finmarken, men har ingensteds fundet den i saa store masser som udenfor Nordkap.

Gen. Entalophora.

*Entalophora deflexa*, Smitt.

Tab. I, 10, II.

*Entalophora deflexa*. Smitt (28), p. 11. tab. 5, fig. 28—30. *Pustulopora deflexa*, Busk, Report on the Polyzoa collected by H. M. S. Challenger, Part 2, p. 20, tab. 4, fig. 3.

Findesteder. St. 223, 273, 323, 363.

Smitt (26) har fra Karahavet nævnt en entalophora, som blev identificeret med Couch's art *tubulipora deflexa*. hvilken forøvrigt af Hincks er opført som en *stomatopora* (8. p. 437. tab. 57, fig. 4).

Levinson (15) opfører ogsaa fra Karahavet en entalophora, men denne blev tydet som *entalophora clarata*. Busk med henvisning til Hincks (8, p. 456).

Samme art er ogsaa af Lorenz (16) angivet som forekommende ved .lan Mayen.

De kolonier, som Nordhavsexpeditionen hjembragte, kan jeg imidlertid ikke faa til at passe med nogen af de nævnte former. Derimod stemmer dens udseende temmelig godt med Smitts beskrivelse og tegninger af entalophora

Fam. Tiibiiliporidae.

Gen. *Tubulipora*.

*Tubulipora flabellaris*. Fabr.

Smitt (24, II), pp. 401, 455; Pl. IX. figs. (5—8. Harmer (>), p 99; Pl. VIII, fig. 4.

Occurrence. Station 366.

This species, it is true, is principally arctic, but its distribution cannot be certainly stated, as it has been confounded with other *Ttdudiporida*\ Vide Harmer (6) on the subject.

Gen. *Idmonea*.

*Idmonea atlantica*. Forbes.

*Tubulipora atlantica*. Smitt (24, II). p. 398; Pl. III, figs

6, 7; Pl. IV. figs. 4-13. *Idmonea atlantica*, Hincks (8), p. 451; Pl. LXV. figs. 1—4.

Occurrence. St. 223, 273. 286. 290, 323, 363.

Is especially arctic in its occurrence, but according to Hincks, is also found at Naples, and in Florida and Madeira. I have taken the species in various places along the Norwegian coast from Bergen to Finmark, but have found it nowhere in such great numbers as off the North Cape.

Gen. Entalophora.

*Entalophora deflexa*, Smitt.

ri. i, tigs. io, n.

*Entalophora deflexa*. Smitt (28). p. 11; Pl. V. figs. 28—30. *Pustulopora deflexa*. Busk, Report on the Polyzoa

collected by H. M. S. Challenger, Part II, p. 20; Pl. IV. fig. 3.

occurrence. St. 223. 273, 323. 363.

Sniitt (26) mentions an *Entalophora* from the Kara Sea, which was identified with Couch's species *Tubulipora deflexa*, which, moreover, is classed by Hincks as a *Stomatopora* (8, p. 437; Pl. LVII. fig. 4).

Levinsen (15) also gives an *Entalophora* from the Kara Sea, but this is designated *Entalophora clarata*, Busk, with a reference to Hincks (8, p. 456).

The same species is also mentioned by Lorenz (1(5) as occurring off Jan Mayen.

I cannot, however, make the colonies brought home by the North Atlantic Expedition agree with any of the above-mentioned forms. On the other hand, their appearance agrees fairly well with Sniitt's description and draw-19

*deflexa* i Florida» Bryozoa, og jeg maa antage, at det virkelig er denne art, som har foreligget. Enhver, som har beskæftiget sig noget med cyclostomate polyzoer, ved hvilke store vanskeligheder ofte er forbundet med at identificere dem, og man tør neppe stole sikkert paa, at den arktiske fauna omfatter baade *entalophora deflexa* og *clavata* samt desuden *stomatopora deflexa*. Couch.

Det, som især synes at karakterisere *entalophora. deflexa*, er den betydelige længde af zoöciernes frie del, jeg har nemlig fundet den af være 0.84—0.96 mm., stundom endog 1.2 mm. Længden ei' nemlig ogsaa underkastet betydelig variation. Zoöciernes tykkelse i den frie del fandtes at variere mellem 0.14—0.18 mm.

Oöcier har jeg ikke fundet, men Smitt har tegnet dem som en opsvulmning under bifurcationen.

ings of *Entalophora deflexa* in Floridan Bryozoa; and I may assume that it really is this species that I have had before me. Any one who has had anything to do with cyclostomatous polyzoans, knows the great difficulties that are frequently connected with their identification; and one dare hardly be sure that the arctic fauna includes both *Entalophora deflexa* and *clavata*, as well as *Stomatopora deflexa*, Couch.

That which seems especially to characterize *Entalophora deflexa*. is the considerable length of the free portion of the zooecia. I have found it to be 0.84—0.96 mm., sometimes as much as 1.2 mm. The length, too, is subject to considerable variation. The thickness of the zoæcia in their free part was found to vary between 0.14 and 0.18 mm.

I have not found any ooecia, but Smitt has drawn them as a swelling below the bifurcation.

(len. *Reticulipora. Reticulipora intricaria*. Smitt.

Tab. I, fig. 12.

*Reticulipora intricaria*, Smitt (24, V), p. 1117, tab. 20, fig. 1—3.

*Diastopora intricaria*, Levinsen (15), p. 21. *Reticulipora intricaria*, Nordgaard (18, II), p. 5.

Pindesteder. St 48. 290, 315.

Af de her opførte Stationer ligger 48 i øst for Island, 290 og 315 mellem Norge og Spitsbergen. Paa dette strøg er arten tagen engang før, nemlig af den svenske Spits-bergexpedition (Smitt). Lindahl har taget den i Baffins Hay, og Dijniphaexpeditionen i Karahavet (Levinsen). Endelig har jeg fundet den ved Sværholt i Finmarken.

Smitt (1. c) har tydelig fremhævet slægtskabet med *diastopora* specielt *obelia* ved tilstedeværelsen af smaarør, tilslutning af de ældre zoöcier ved en kalklamel, o. s. v. Denne kalklamel (operculum) er ogsaa her perforeret. De kolonier jeg havde til undersøgelse, afgav nok et vidnesbyrd om nært slægtskab med *diastopora*, idet der i grenenes kant forekom et listeagtigt fremspring svarende til basalskivens udvidelse hos *diastopora* (the marginal extension of the basal lamina).

Længden af den frie del af zoöcierne ved 0.4—0.6 mm. og tykkelsen ca. 0.12 mm.

Gen. Reticulipora. *Reticulipora intricaria*, Smitt

Pl. I, fig. 12.

*Reticulipora intricaria*, Smitt (24, V), p. 1117; Pl. XX, figs. 1—3.

*Diastopora intricaria*. Levinsen (15), p. 21. *Reticulipora intricaria*, Nordgaard (18, II), p. 5.

Occurrence. St. 48, 290, 315.

Of the above-mentioned stations, 48 lies east of Iceland, and 290 and 315 between Norway and Spitsbergen. The species has been taken once before in this district, namely, by the Swedish Spitsbergen Expedition (Smitt). Lindahl has found it in Baffin's Bay, and the Dijnphna Expedition in the Kara Sea (Levinsen). Lastly, I have found it at Sværholt in Finmark.

Smitt (1. c) has clearly pointed out the relationship to *Diastopora*, especially *obelina*, in the presence of small tubes, the closing of the older zoecia by a calcareous lamella, etc. This calcareous lamella (operculum) is perforated here too. The colonies I examined possessed yet another proof of their near relationship to *Diastopora*, in the occurrence of a fillet-like projection at the edge of the branches, corresponding to the extension of the basal lamina in *Diastopora*.

The length of the free portion of the zooecia was from 0.4 to 0.6 mm., and its thickness about 0.12.20

Fam. Horneridae.

Gen. Hornera.

*Hornera lichenoides* (Pontopidan), Linn.

Smitt (24, II), p. 404, tab. 7, fig. 1 — 14. Hincks (8), p. 408, tab. 67, fig. 1 5.

Findesteder. St. 223. 273. 275, 290, 315, 337.

Paa st. 275 forekom den robuste varietet. Er særlig arktisk, men gaar sydover til Holuislän. Shetland og Hebriderne.

Kam. Horneridæ.

Gen. Hornera.

*Hornera lichenoides* (Pontopidan), Linn.

Smitt (24, II), p. 404; Pl. VII. tigs. 1 — 14. Hincks (8), p. 468; Pl. LXVI I. figs. 1—5.

Occurrence. St. 223, 273. 275, 290. 315, 337.

The robust variety occurred at Station 275. Is distinctly arctic, but is found southwards as far as Bohusliin. the Shetlands, and the Hebrides.

Fam. Lichenoporidae.

Gen. Lichenopora.

*Lichenopora hispida*, Klem.

*Discoporélla hispida*. Smitt (24. 11), p. 406, 483, tab. 11. fig. 10—12.

*Lichenopora hispida*, Hincks (8), p. 473. tab. 68, fig. 1—8.

Findested. St. 337.

Udbredt fra Norge til Frankrige.

*Lichenopora verrucaria*. Fabr.

*Discoporélla verrucaria*, Smitt (24. II), p. 405, 479, tab. 10, fig. 6—8.

*Lichenopora verrucaria*. Hincks (8). p. 478, tab. 64, fig.

4—5.

„, Harmer (5), tab. 7, fig. 1 — 9.

Findested. St. 366 (paa alger).

Udbredt fra Spitsbergen til England og fra Karahavet til Grønland.

Fam. Lichenoporidae.

Gen. Lichenopora.

*Lichenopora hispida*. Flem.

*Discoporélla hispida*. Smitt (24. 11). pp. 406, 483; Pl. XI. figs. 10-12.

*Lichenopora hispida*. Hincks (8), p. 473; Pl. LXVI 11, figs. 1-8.

Occurrence. Station 337.

Distributed from Norway to France.

*Lichenopora verrucaria*. Fabr.

*Discoporélla verrucaria*. Smitt (24. II), pp. 405. 479; Pl. X, figs. 6—8.

*Lichenopora verrucaria*, Hincks (8), p. 478; Pl. LXIY.

figs. 4, 5.

Harmer (5), Pl. VII, figs. 1 — 9.

Occurrence. Station 366 (on alga»).

Distributed from Spitsbergen to England, and from the Kara Sea to Greenland.

Gen. Defrancia.

*Defrancia lucernaria*, M. Sars.

Tab. I, fig. Hi—IT.

*Tubulipora lucernaria*. M. Sars (22), p. 145. *Defrancia lucernaria*. M. Sars (23), g. 164.

Smitt (24, II), p. 408, 493. „, *truncata*, Husk (3), p. 35, tab. 1, fig. 8. „, *lucernaria*, Busk (2, Part 3), p. 36, tab. 33, fig. 3.

*Domopora stellata*, Lorenz (16), p. 99.

„, *lucernaria*, Levinsen (15), p. 22 (sep.).

Gen. Defrancia.

*Defrancia lucernaria*, M. Sars. Pl. I, %s. t(i, IT.

*Tuhidipora lucernaria*. M. Sars (22), p. 145. *Defrancia lucernaria*. M. Sars (23), p. 104.

Smitt (24. II, 1))]. 408, 493. *truncata*, Busk (3), p. 35; Fl. I. fig. 8. „, *lucernaria*. Busk (2. Part 3), p. 36; Pl. XXXIII, fig. 3.

*Domopora stellata*, Lorenz (16), p. 99.

„, *lucernaria*, Levinsen (15), p. 22.21

Findesteder. St. 267, 290, 323, 357, 363, Porsangerfjorden.

Denne art opdagedes først af M. Sars paa lians reise til Lofoten og Finmarken i 1849. I lians herom afgivne



beretning blev den kortelig beskrevet under navnet *tubuli-ipora lucernaria*. Den gjenfandtes ved Finmarken i 1856 af M'Andrew, og Busk identificerede den feilagtig med Jamesons art *domopora truncata*. Senere er arten udførligere beskrevet af M. Sars (23) og Smitt (24, II).

Lorenz (16, p. 99) opfører *domopora stellata*, Gold-fuss fra Jan Mayen, men udtrykket „durcli einen hosonders dttnnen Stiel ausgezeichnet" vidner om. at det er *defrancia lucernaria*, som har foreligget. (Jan Mayen som findested for *domopora stellata* bør saaledes udgaa).

*Dejrancia lucernaria* har efter dette følgende udbredelse: Karahavet, Kola, Spitsbergen, Grønland (Levinsen, Smitt), Jan Mayen (Lorenz), nordlige Norge (M. Sars). I Norge har Sars taget nævnte art ved Vadsø, i Komagfjord og Øxfjord (Finmarken), ved Beian (Trondhjemsfjorden), samt i Kristianiafjorden et forkrøblet eksemplar. Aurivillius omtaler den fra Kvænangen, og jeg har vinteren 1899 taget den paa forskjellige steder fra Lofoten til Pors-angerfjorden. Jeg sætter foreløbig Lofoten som artens sydgrænse ved vor kyst; thi det ene (muligens ogsaa subfossile eksemplar), som M. Sars tog ved Vallø i Kristianiafjorden kan ikke berettigge til at flytte udbredelsesgrænsen did. Ved Beian er den heller ikke gjenfunden siden Sars's dage. Et interessant faktum er det imidlertid, at denne udpræget arktiske form i dette aarhundrede er observeret baade i Trondhjems- og Kristianiafjorden. For at levere et billede af de fysiske forhold, hvorunder *defrancia lucernaria* lever, vil jeg opføre dybde, temperatur og saltgehalt paa endel af de steder, hvor arten observeredes paa min reise vinteren 1899, samt paa Nordhavexpeditionens stationer.

Occurrence. St. 267, 290, 323. 357, 363, Porsanger Fjord.

This species was first discovered by M. Sars on his journey through Lofoten and Finmark in 1849. In his report, it was briefly described under the name *Tabalipora lucernaria*. It was found again in Finmark, in 1856, by M'Andrew, and Busk identified it erroneously with Jameson's species *Domopora truncata*. The species was subsequently described at greater length by M. Sars (23) and Smitt (24. II).

Lorenz (16. p. 99) records *Domopora stellata*, Gold-fuss, from Jan Mayen, but the expression „durcli einen besonders dünnen Stiel ausgezeichnet", shows that it has been *Dejrancia lucernaria*. (Jan Mayen ought therefore to be omitted from the list of places where *Domopora stellata* is found).

According to this, *Defrancia lucernaria* has the following distribution: the Kara Sea, the Kola Peninsula, Spitsbergen, Greenland (Levinsen, Smitt), Jan Mayen (Lorenz), the north of Norway (M. Sars). Sars has found the species in Norway, at Vadsø, in the Komagfjord and Ox-fjord (Finmark), at Beian (Trondhjem Fjord), and a deformed specimen in the Kristiania Fjord. Aurivillius mentions it from Kvænangen, and I found it in the early part of 1899 in various places from Lofoten to Porsanger Fjord. In the mean time, I would set Lofoten as the southern limit of the species on our coast; for the single (possibly also subfossilised) specimen found by M. Sars at Vallø in the Kristiania Fjord, does not justify the removal of the distribution limit thither. Nor has it been found again at Beian since Sars's day. It is, however, an interesting fact that this peculiarly arctic form has been observed during this century both in the Trondhjem and Kristiania Fjords. In order to give a representation of the physical conditions in which *Defrancia lucernaria* lives, I will give the depth, temperature and salinity at some of the places where the species was observed during my journey at the beginning of 1899, and at the North Atlantic Expedition Stations.

1890 Sted Dybde Temp. Saltgehalt 3die mars Kirkfjorden . 50 in. 2.r>° G 33.40 o/,,., (Moskenesø) 19de april Kvænangen 90 - 0.7m0 - 34.21 - 2 Ide „ Jøkelfjord .... 90 - 1.4° - 34.!!.", - 27(le „ Porsangerfjord . 200 - 0.'2° - 34.48 -

1899 Place Depth [-Temperature-] {+Tempera- ture+} Salinity March 3 Kirkfjord .... 50 ni. 2.f>° C. 33.40 „,o (Moskenesø) April 19 Kvænangen . 90 - 0.7f>° - 34.-il • 21 Jøkelfjord .... 90 - 1.4° - 34.35 - , 27 Porsanger Fjord 200 - 0.'2° - 34.48 -22

For Norilhavsexpditionens findesteder stiller natur- With regard to the North Atlantic Expedition, forholdene sig saaledes: natural conditions in the places ol' occurrence arc

follows:

Station Dylulc Temperatur Station Depth Temperature 267 271 in. : 1.4° C. 267 271 ill. — 1.4° t'. 290 349 - 3 f>° - 290 349 - 3.:>° - 323 408 - 1.5® - 323 408 - 1 ,T>° - 357 229 - 1.9° - 357 229 - 1.0° - 363 475 - 1.1° - 363 475 - 1.1° -C t e n o s t o m a t a.

C t e i l o s t o l l a t a,

Fain. Alcyonidiidae.

Gen. Alcyonidium.

Alcyonidium gelatinosum. Linn.

Hincks (8), p. 491. tab. 69, fig. 1--3. Levinsen (14), p. 80, tab. 7. fig. 21—28.

Findesteder. Østhavet (sandsynligvis St. 322), St. 260, 363.

Udbredt fra Spitsbergen ti) Kanalen og fra Novaja Senilja til Grønland.

Kam. Alcyonidiidae.

Gen. Alcyonidium.

Alcyonidium gelatinosum, Linn.

Hincks (8), p. 491; Pl. LXIX, figs. 1—3. Levinsen (14), p. 80; Pl. VII, figs. 21—28.

Occurrence. The Barents Sea (probably Station 322), St. 260, 363.

Distributed from Spitsbergen to the English Channel, and from Novaja Senilja to Greenland.

Alcyonidium disciforme, Smitt.

Alcyonidium mamillatum. var. disciforme. Smitt (24, V),

p. 1123. tab. 20, fig. 9. Alcyonidium disciforme, Levinsen (15"), p. 23, tab. 27,

fig. 13. „, Smitt (26), p. 11. „, „, Bidekap (1), p. 633.

Findesteder. St. 267, 323.

Denne eiendommelige alcyonidium er før funden i Karahavet (Levinsen, Smitt), mellem Norge og Spitsbergen (Smitt), samt ved Østspitsbergen (Bidekap). Paa min ekspedition vinteren 1899 tog jeg desuden 3 eksemplarer i Lyngen-fjorden (32(1 m., lerbund, temp. 3.05° C., saltgeh. 34.84 ‰). Arten blir saaledes ogsaa at henføre til Norges fauna.

De eksemplarer, hvorpaa Smitts beskrivelse baseredes, var skiveformede, mens de, som Levinsen og Bidekap

Alcyonidium disciforme, Smitt,

Alcyonidium mammillatum var. disciform/. Smitt (24, V),

p. 1123; Pl. XX, fig. 9. Alcyonidium disciforme, Levinsen (15), p. 23; PL XXVII,

fig. 13.

„, „, Smitt (26), p. 11.

„, „, Bidekap (1), p. 633.

Occurrence. St. 267, 323.

This characteristic Alcyonidium has been found in the Kara Sea (Levinsen, Smitt), between Norway and Spitsbergen (Smitt), and at Eastern Spitsbergen (Bidekap). During my expedition in the early part of 1899, I also found 3 specimens in the Lyngen Fjord (depth 320 m., clay bottom, temperature 3.05° C., salinity 34.84

‰/00). The species may thus also be classed among the fauna of Norway.

The specimens upon which Smitt's description was based, were disc-shaped, while those that Levinsen and 24 havde til undersøgelse, dannede flade ringe. Fra St. 323 havde jeg tiere kolonier, hvoraf enkelte dannede en skive, andre en flad ring, og atter andre havde form af en liden hætte. Paa St. 267 samt i Lyngenfjorden forekom de ogsaa dels i ring, dels i skiveform. Hidtil er altsaa il. disciforme kun funden i den østlige del af Ishavet.

Blandt Nordhavsexpeditionens materiale fandtes ogsaa en liden koloni af *rabdopleura* (fra St. 10), men den var saa daarlig konserveret, at man intet væsentligt kunde se paa den. Det eneste, som saaledes kan konstateres, er alene forekomsten paa nævnte sted.

Selv om man til Norges fauna henfører alt, som findes indenfor territorialgrænsen (4 kv.mil fra land), blir der dog 3—4 arter i foranstaaende fortegnelse, som ialfald foreløbig ikke kan medregnes til vor fauna. Disse er, *menipea normani*, *membranipora spitsbergensis*, *entalophora deflexa* og sandsynligvis *membranipora cornigera*. Forøvrigt kan bemærkes, at fortsatte undersøgelser i fjordene nordpaa ganske sikkert vil fremdrage en og anden form, som er funden ved Spitsbergen f. eks., men ikke i Finmarken. Efter en løs mønstring af det materiale, som jeg medbragte fra min vinterekspedition 1899, har jeg for faunaen indvundet to nye og eiendommelige polyzoformer, nemlig *smittia trispinosa* var. *arborea* og *alcyonidium disciforme*. Den første fra Porsanger-, den anden fra Lyngen-fjorden. Efter de hydrografiske undersøgelser, som jeg fik anledning til at anstille, finder jeg det heller ikke paafaldende, at høiarktiske polyzoer forekommer i de nordlige fjorde. I Porsangerfjorden mellem store og lille Tamsø fandtes saaledes 27de april 1899 paa bunden i 200 meters dyb en temperatur 0.2° C. og saltgehalt 34.48 ‰/on. Paa dette sted tog jeg *smittia trispinosa* var. *arborea*. I Lyngenfjordens ytre del maalte jeg 3die mai 1899 i 320 meters dyb (bund) temperaturen 3.05° C. Saltgehalten fandtes senere ved titrering at være 34.84 ‰/00. Her forekom blandt andet ogsaa *alcyonidium disciforme*. I Jøkelfjorden (arm af Kvæangen) var den 20de april 1899 i 80 meters dyb temp. 0.1° C., saltgeh. 34.20 ‰/00. Her tog jeg diverse arktiske polyzoer saasom *myriozoum crustaceum*, *mucronella sincera*, *rhamphostomella scabra*, *defrancia lucernaria*, etc. Imidlertid vil jeg her ikke gaa nærmere ind paa den hydrografiske side af sagen, jeg vil kun nævne at det voksende kjendskab til fjordenes og havkystens hydrografi utvilsomt vil bidrage til løsningen af adskillige zoogeografiske spørgsmaal.

Hincks (8) opfører 235 arter af polyzoer for den britiske fauna og for 28 af disse er Shetland den eneste britiske lokalitet. Af de 28 var 8 ikke funden udenfor Sliet-

Bidenkap examined were in ille form of flat rings. I had several colonies from Station 323, in which some were in the form of a disc, others of a flat ring, while others again were in the form of a little cowl. At Station 267 and in the Lyngen Fjord, too, they occurred partly in the shape of rings, partly discoidal. A. disciforme has thus hitherto only been found in the eastern part of the Polar Sea.

A little colony of *Habdopleura* (from Station 10) was also in the North Atlantic Expedition collection; but it was in such a bad state of preservation, that nothing of any consequence could be seen in it. The only thing that can be proved is its occurrence in the above-named place.

Even if all that are found within four miles of the shore, were to be referred to Norway's fauna, there would still be 3 or 4 species in the above list, that for the present, at any rate, cannot be reckoned among our fauna. These are *Menipea normani*, *Membranipora spitsbergensis*, *Entalophora deflexa*, and probably *Membranipora cornigera*. It may be further remarked that continued investigations of the northern fjords will certainly bring to light some form or other that is found, for instance, in Spitsbergen, but not in Finmark. After a casual review of the collection that I brought back from my expedition in 1899, I find that I have added two new and characteristic forms of Polyzoa to the fauna, namely, *Smittia trispinosa* var. *arborea* and *Alcyonidium disciforme*, the first from Porsanger, the second from Lyngen Fjord. After the hydrographic investigations that I was enabled to prosecute, I do not consider it at all remarkable that extreme arctic Polyzoa should occur in the fjords of the north. In the Porsanger Fjord, between Great and Little Tamsø, for instance, there was found, on April 27th, 1899, on the bottom at a depth of 200 metres, a temperature of 0.2° C., and salinity 34.48 ‰/00. At

this spot I found *Smittia trispinosa* var. *arborea*. In the lower part of Lyngen Fjord, on May 3rd, 1899. I found on the bottom, at a depth of 320 metres, a temperature of 3.(>:>° C. The salinity was subsequently found by titration to be 34.84 0 00. *Alcyonidium disciforme* occurred here, among others. In Jøkelfjorden, an arm of Kvænangen, on April 20th, 1899, at a depth of 80 metres, the temperature was 0.0° C., the salinity 34.29 u/00. Here I found various arctic Polyzoa, such as *Myrionozoum crustaceum*, *Mucronella sincera*. *Rhamphostomella scabra*. *Defrancia lucernaria*, etc. I shall not, however, go further into the hydrographical side of the question here. I will only-remark that the increasing knowledge of the hydrography of the fjords and coast will contribute to the solution of various zoögeographical questions.

Hincks (8) puts down 235 species of Polyzoa as belonging to the British fauna, and for 28 of these the Shetland Isles is the only locality. Eight of these 28 were

land, og de resterende 20, som næsten alle er arktiske former, har her fundet sin sydgrænse. Den engelske polyzofauna omfatter omtrent dobbelt saa mange arter som den norske, der er endvidere et betydeligt fællesskab i former baade af boreal og arktisk natur, men der gives dog adskillige norske arter, som ikke forekommer ved Storbritanniens kyster. Disse er for den allerstørste del af ren arktisk karakter. Af saadanne har jeg hidtil merket mig følgende:

*Menipea normani*, Nordg.

*Kinetoskias smittii*, Dan. & Koren.

., *arborescens*, Dan. & Koren.

*Flnstra membranaceo-truncata*, Smitt. ., *abyssicola*, M. Sars.

*Membranipora cymbaeformis*, Hincks. ., *arctica*, D'Orb.

*Cribrilina nitido-punctata*, Smitt. ., *scutulata*, Busk.

*Myrionozoum erustaceum*, Smitt. ., *coarctatum*, M. Sars.

*Lepralia spatiulifera*, Smitt.

*Porella eleyantula*, D'Orb. ., *proboscidea*, Hincks.

*Escharoides sarsii*, Smitt.

*Smittia porifera*, Smitt. ., *arctica*, Norman. ., *lineata*. Nordg. ., *reticulato-yunctata*, Hincks. ., *propinqua*, Smitt. ., *pahnata*, M. Sars. ., *trispinosa* var. *arborea*, Levinsen.

*Mucronella* (*lepralia*), *cruenta*, Norman. ., *labiata*, Boeck. ., *sincera*, Smitt.

*Retepora cellulosa*, Linn. ., *elongata*, Smitt.

*Rhamphostomella scabra*, Fabr.

., *costata*, Lorenz.

., *plicata*, Smitt.

*Cellepora noaulosa*, Lorenz. ., *incrassata*, Lamarck.

*Reticulipora intricaria*, Smitt.

*Defrancia lucernaria*, M. Sars.

*Alcyonidium disciforme*, Smitt.

En flerhed af de her opførte er ikke ved vor kyst observeret søndenfor polarcirklen, men der gives ogsaa enkelte, som forekommer søndenfor denne, men alligevel er utvilsomt arktiske. En saadan er f. eks. *Kinetoskias arborescens*. Den er funden i Karahavet paa 20—58 favne (Levinsen), i Wijdebay paa Spitsbergen i 40 favne (Smitt), endvidere har Danielsen taget den ved Vadsø, 90 favne. Naar saa Nordkavsexpeditionen tog den samme

art paa et dyb af 672 favne i Sognefjorden, maa det være et eksempel blandt flere paa, at en arktisk fonn har holdt sig gjennem

Den norske Nordliavsexpedition. O. Nordgaard: Polyzua.

not found out of the Slietlands, and the remaining 20

7 o

which were nearly all arctic forms, had their southern limit there. The British polyzoan fauna comprises about twice as many species as the Norwegian. They have moreover, a considerable number of forms ir, common, but there are also a good many Norwegian species that do not occur on the shores of Great Britain. By far the greater number of these are of a purely arctic character. Of these, I have up to the present noted the following:

*Menipea normani*, Nordg.

*Kinetoskias smittii*, Dan. & Koren.

„*arborescens*, Dan. & Koren.

*Hustra membranaceo-truncata*, Smitt. „ (*diyssicola*, M. Sars.

*Membranipora cymbæformis*, Hincks. „, *arctica*. D'Orb.

*Cribrilina nitido-pundata*. Smitt. „, *scutulata*, Busk.

*Myrionozoum crustaceum*, Smitt. „, *coarctatum*, M. Sars.

*Lepralia spathulifera*, Smitt.

*Porella eleyantula*, D'Orb. „, *proboscidea*, Hincks.

*Escharoides sarsii*, Smitt.

*Smittia porifera*, Smitt. „, *arctica*, Norman. „, *lineata*, Nordg. „, *reticulato-punctata*, Hincks. „, *propinqua*, Smitt. „, *pahnata*, M. Sars. „, *trispinosa* var. *arborea*, Levinsen.

*Mucronella (lepralia) cruenta*, Norman. „, *labiata*, Boeck. „, *sincera*, Smitt.

*Illeptopora cellulosa*, Linn. „, *élongata*, Smitt.

*Rhamphostomella scabra*, Fabr.

„, *costata*, Lorenz.

„, *plicata*, Smitt.

*Cellepora nodulosa*, Lorenz. „, *incrassata*, Lamarck.

*Reticulipora intricaria*, Smitt.

*Defrancia lucernaria*, M. Sars.

*Alcyonidium disciforme*. Smitt.

The majority of the species in this list have not been observed on our coast south of the arctic circle; but there are also a few that do occur south of this, but are nevertheless undoubtedly arctic. *Kinetoskias arborescens* is one of these. It was found in the Kara Sea in depths of 20—58 fathoms (Levinsen), in Wijde Bay in Spitsbergen, at a depth of 40 fathoms (Smitt), and Danielsen has found it at Vadsø, 90 fathoms. That the North Atlantic Expedition found the same species at a deptli of 672 fathoms in the Sognefjord, must be taken as one instance among

4tie skiftende tider pan de store dyb i vore fjorde. Disse fjorddyb udmerker sig ved en stor stabilitet i de fysiske forhold. Temperaturen er ti—7° C. og saltgehalten 35 ‰ eller lidt over. Det ligger da nan- at antage, at saadanne forhold ogsaa maa egne sig vel for former af sydlig oprindelse. Selv saa langt mod nord som i

Vestfjordens dybbassin har (i. O. Sars fundet bundfaunaen at være væsentlig sydlig, mens nævnte fjords littoralfauna havde et arktisk præg. Littoralfaunaens større afhængighed af den geografiske bredde bunder sandsynligvis i hydrografiske forhold, idet vandlaget fra 0—200 ä 250 meter staar under direkte indflydelse af de meteorologiske faktorerers aarlige variation.

I Vestfjordens største dyb (Tranødybet) tog jeg 16de marts 1899 ved trawling i en dybde af en dybde af ca. 600 meter 3 eksemplarer af *Kinetoskias smittii*. Temperaturen var 6.3° C., saltgehalten 35.06 ‰, den aarlige forandring er for intet at regne. *Kinetoskias arborescens* i Sognefjorden, og *smittii* i Vestfjorden levede saaledes under omtrent de samme hydrografiske forhold, men det er aabenbart stor forskjel paa deres zoogeografiske karakter. Den første er arktisk, og den maa i Sognefjorden betragtes som en reliket form, mens *Kinetoskias smittii* i baade af andre og af mig er taget i en flerhed af eksemplarer i de vestlandske fjorde, Trondhjemsfjorden, o. s. v., men den er ikke taget i egentlig arktiske farvand, følgelig maa den være boreal og ved sin optneden i Vestfjorden, Tysfjorden etc. betegnes som en sydlig emigrant. Denne betegnelse kan uden tvil ogsaa anvendes paa *Bicellaria alderi* ved dens forekomst paa St. 315 (74° 53' N. Br.). Havde Golfstrømmen ikke været, vilde visselig ogsaa denne polyzo have manglet paa dette sted. Derimod er *Flustra abyssicola* en arktisk og gammel fonn, sandsynligvis den ældste af de recente flu-straer.

Den norske polyzo verdens stærkt arktiske karakter giver sig blandt andet tydeligt tilkjende ved sammenligning med Grønlands. At *Vaiihøfteiis* fortegnelse\*) (30, p. 233) har jeg noteret følgende, som endnu ikke er fundne ved norsk kyst:

*Céllaria articulata*, Fabr.

*Flustra serrulata*, Busk.

*ScMzoporeUa biaperta*. Michelin.

*Hippotilioa expansa*, Dawson.

*Forella acutirostris*, Smitt. ., *perpusilla*, Busk.

*Cellepora whiteavesi*, Norman.

*Stomatopora penicillata*. Fabr.

*diastoporoides*, Norman.

many of an arctic form having remained through changing periods in the great depths in our fjords. These fjord-depths are remarkable for a great stability in their physical conditions. The temperature is 6° or 7° C., and the salinity 35 ‰ or a little more. It is then natural to suppose that such conditions must also be well adapted for forms of southern origin. This, too, has proved to be the case. Even as far north as in the deep basin of the Vestfjord, G. O. Sars has found the bottom fauna to be essentially southern, while the littoral fauna of the same fjord was arctic in character. The great dependence of the littoral fauna upon the geographical latitude, probably rests upon hydrographical conditions, as the water-stratum from 0 to 200 or 250 metres, is under the direct influence of the annual variations of the meteorological factors.

In the Vestfjords greatest depth (Tranø depth), on March 16th, 1899, I caught, when trawling in a depth of about 600 metres, 3 specimens of *Kinetoskias smittii*. The temperature was 13.5° C., the salinity 35.06 ‰, the annual variation cannot be reckoned as anything. Thus *Kinetoskias arborescens* in the Sognefjord, and *smittii* in the Vestfjord, lived under almost the same hydrographical conditions; but there is evidently a great difference between their zoögeographical characters. The first is arctic, and in the Sognefjord it must be regarded as a relict form; while a number of specimens of *Kinetoskias smittii* have been found by myself and others in the west-country fjords, the Trondhjem Fjord, etc., but it has not been found in truly arctic waters. It must therefore be boreal, and in its appearance in the Vestfjord, Tysfjord etc., be designated a southern emigrant. This designation may also without doubt be used for *Bicellaria alderi*, from its occurrence at Station 315 (74° 53' N. Lat.). Had there been no Gulf Stream, this polyzoan would certainly not have been found in this place. On the other hand,

*Flustra abyssicola* is arctic, and an early form, probably the earliest of the recent *Flustra* species.

The extremely arctic character of the Norwegian *Polyzoa* is clearly seen, among other things, by a comparison with that of Greenland. I have noted down the following species from Vanhöffen's list\*) (30, p. 233), which have not been found on the Norwegian coast:

*Cellaria articulata*, Fabr.

*Flustra serrulata*, Busk.

*Schizoporella biaperta*, Michelin.

*Hippotylia expansa*. Dawson.

*Porella acutirostris*, Smitt. „, *perpusilla*, Busk.

*Cellepora richitae*, Norman.

*Stomatopora penicillata*, Fabr.

„, *diastoporoides*, Norman.

\*) Denne fortegnelse er saavidt jeg kan forstaa, meget fuldstændig. Idetmindste én art er dog udeglemt, nemlig *Cribrilina scutulata*, Busk.

\*) As far as I am able to judge, this list is very complete, but, one species at least, has been omitted, namely, *Cribrilina scutulata*, Busk.<sup>27</sup>

*Diastopora maeandrina*, Wood.

*Bowerbankia arctica*, Rusk.

*Biiskia nitens*. Alder.

Disse udgjør omtrent 14 pct. af samtlige arter i fortegnelsen. Størsteparten af de ovenfor anførte arter er heller ikke observeret ved Spitsbergen eller i Karahavet.

Af de 7 arktiske former, som forekommer ved Queen Charlotte Islands men ikke ved britiske kyster er den kun én nemlig *Cellaria articulata*, som endnu ikke er indlemmet i vor fauna. De øvrige (5 (*Flustra membranacea*, *Membranipora arctica*, *Myriozeugma coarctatum*, *Rhynchostoma plicata*, *Cellepora incrassata*, *Retepora elongata*) er vel kjendte fra vor arktiske region.

Da jeg sommeren 1894 udenfor Nordkyn i Finmarken tog op en *Laminaria hyperborea*, som fra grunden til toppen (70 cm.) var tæt besat med *Gemellaria loricata* i yppig vekst, blev jeg slaaet over denne tydelige tilkjendegivelse af livskraft. Paa min reise forleden vinter havde jeg anledning til at skraabe nogoé i trange og strømsterke sund i Finmarken, og det viste sig ogsaa der, at enkelte arter som *Gemellaria*, *Menipea*, etc. havde en enestaaende kraftig vekst. Studiet af polyzoerne bekræfter saaledes det almindelige indtryk, at arktiske dyr i regelen er kraftige og velfødte. Med andre ord, arktiske former viser over-, legenhed i størrelse og udvikling i det hele taget fremfor sin nære slektninge blandt de boreale dyr. Dr. Pfeffer\*) udtaler ogsaa om polyzoerne: „Sie fobien nirgends vidlig, sind aber in den Tropen und den grossen Tiefen sparsamer, dagegen in den kälteren gemässigten Zonen am häufigsten nächst dem in den polaren Zonen am hesten entwickelt". Hvad kan grunden være hertil? Jeg tror, at polyzoernes rige udvikling i de polare have hænger sammen med de selvsamme haves store planktonrigdom. Ifølge sin bygning og sit fastsiddende voksesæt er polyzoerne udelukkende henvist til at leve af plankton eller af organiske rester, som findes suspenderet i vandet\*\*). Heraf synes at frem-

\*) Die niedere Tierwelt des antarktischen Ufergebietes.

\*\*) Ved en enkelt anledning har jeg seet individerne i en polyzo-koloni foretage bevægelser, som jeg opfattede som spisning. Paa ruderne i et af akvarierne ved den biologiske station havde nemlig fæstet sig kolonier af *Membranipora membranacea*, udviklet grundlagt af larver, som var indkomne med ledningsvandet. .Teg kunde

da tydeligt se, hvorledes polypiderne uophørligt skjøv sin tentakelkrans sammenlagt i form af et rør ud af munden, derpaa sprede kransen ud i tragtform for saa efter en liden stunds forløb at trække den ind. Det er muligt at dette ogsaa var en aandedrætsbevægelse, men at der paa den maade tillige skede en tilførsel af næring, synes mig utvilsomt. Egentlig talt kan man neppe tænke sig nogen anden maade at spise paa for disse dyr. I det samme akvarium har jeg seet en sjøpølse (*Cucumaria frondosa*) foretage tentakelbevægelser, som ganske sikkert havde med ernæringen at gøre. Hos *Cucumaria* blev ikke hele tentakelkransen trukket ind samtidig, men hver enkelt af hovedgrenene blev afvekslende puttet ind i munden.

*Diastopora maeandrina*. Wood.

*Bowerbanlåa arctica*, Busk.

*Buskia nitens*, Alder.

These amount to about 14 per cent of the total number of species in the list. The greater number of the above-named species have not been observed in Spitsbergen or the Kara Sea.

Of the 7 arctic forms that occur in Queen Charlotte Islands, but not on the shores of Great Britain, there is only one, namely *Cellaria articulata*, that has not yet been incorporated in our fauna. The other 6 (*Flustra membranacea-truncata*, *Membranipora arctica*, *Myrionozoum coarctatum*, *Rhamphostomella plicata*, *Cellepora incrassata*, *Retepora elongata*) are well known from our arctic region.

In the summer of 1894, when, off Nordkyn in Finmark, I drew up a *Laminaria liyverborea* that was covered from top to bottom (70 cm.) with a luxuriant growth of *Gemellaria lorieata*, I was struck with this clear evidence of vital force. During my expedition last winter, I had occasion to dredge a little in narrow channels in Finmark where the current was strong, and it proved that there too, certain species, such as *Gemellaria*, *Jlenipea*, etc. were of an exceptionally strong growth. The study of polyzoans thus strengthens the general impression that arctic animals as a rule are strong and thriving. In other words, arctic forms on the whole, exhibit a superiority as to size and development, to their near relations among the boreal animals. Dr. Pfeffer\*) also says of polyzoans: „Sie feillen nirgends vüllig, sind aber in den Tropen und den grossen Tiefen sparsamer, dagegen in den kälteren gemässigten Zonen am häufigsten nächstdem in den polaren Zonen am besten entwickelt". What can be the reason of this? I believe that the luxuriant development of the Polyzoa in the polar sea is connected with the great abundance of plankton in that sea. From their structure and their fixed manner of growth, polyzoans are compelled to live exclusively on plankton or organic remains that are found suspended in the water\*\*). From this it would

\*) Die niedere Tiervelt des antarktischen Ufergebietes.

\*\*) On one occasion I have seen the individuals in a colony of Polyzoa going through movements which I took to be eating. Colonies of *Membranipora membranacea* had fastened themselves to the glass in one of the aquaria in the biological station, without doubt growing upon larvæ that had come in with the water-supply. I could distinctly see how the polypides incessantly pushed out their circlet of tentacles folded together in the form of a tube, and then spread them out in a funnel-shape, only to draw them in again in a little while. It is possible that this was also a respiratory movement, but I have no doubt whatever that in this way a supply of nourishment was also taken in. Strictly speaking, it is hardly possible to imagine any other way for these animals to eat. In the same aquarium, I have also seen a sea-cucumber (*Cucumaria frondosa*) making tentacular movements which were certainly connected with feeding. In *Cucumaria* the whole circlet of tentacles was not drawn in at once, but each of the main branches was put into the mouth in turn.

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gaa med sikkerhed, at polyzomængden maa staa i afhængighedsforhold til planktonmængden. Jeg skal imidlertid ikke her gaa nærmere ind paa dette spørgsmaal. Ved de paabegyndte undersøgelser i det nordlige Norge haaber jeg senere at kunne levere bidrag til forstaaelse af polyzoernes samt ogsaa andre dyregruppers biologi.



appear without doubt that the quantity of polyzoans must be dependent upon the quantity of plankton. I shall not, however, go further into this question here. After the investigations begun in northern Norway, I hope to be able subsequently to contribute towards an understanding of the biology of the Polyzoa and other groups of animals. Literaturfortegnelse (Bibliography).

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Bidenkaps arbeide i Tromsø museums aarshefte, 20, 1897 (Undersøgelser over Lyngenfjordens evertebratfauna) com mig ihænde, efterat manuscriptet var næsten færdigt.

Bidenkap's paper in the Tromsø Museum Year-book, 20, 1897 (Undersøgelser over Lyngenfjordens evertebratfauna) did not come under my notice until my manuscript was almost ready.Figiirforklaring.

Explanation of the Figures.

Fig. 1. Mijrizoum coarctatum, M. Sars. Koloni

fra Malangen (taget af mig)..... 1/1

- 2. Menipea normani, n. sp. Koloni fæstet til

en liden sten..... 1/1

- 3. Menipea normani. Den nederste del af

stammen..... 17/1

- 4. Menipea normani. Del af en gren, det

øverste avicularium er afbrukket. . . . 60/1

- 5. Menipea normani. Bagsiden af zoariet

visende udspringet af kitintuberne (the radical fibres), af hvilke den øverste løber efter basis af en bifurkation.....  
60/1

- 6. *Menipea normani*. Bagsiden af to zoöcier

visende beliggenheden af de laterale avicularier (a)..... 60/1

7. *Menipea normani*. Zoöciemundingen og frontaviculariet..... 60/1

- 8. *Menipea normani*. Frontaviculariet seet fra siden.....100/1

- 9. *Smittia trispinosa*. var. *arhorea*, Levinsen. Koloni fra St. 357..... 1/1

- 10. *Entalophora deflexa*, Smitt. Koloni paa en liden sten (St. 363)..... 3/1

- 11. *Entalophora deflexa*, Smitt. Stykke af en gren..... 30/1

- 12. *Reticulipora intricaria*, Smitt. Stykke af zoariet..... 1/1

- 13. *Mucronella sincera*, Smitt. Zoöcier af en koloni fra havet ved Nordkap .... 30/1

- 14. *Mucronella sincera*, Smitt. Zoöcier af en koloni fra Nordhavexp. (ukjendt sted) . . 30/1

- 15. *Mucronella sincera*, Smitt. Zoöcier af en koloni fra Hammerfest..... 30/1

- 16. *Defrancia lucernaria*, M. Sars. Koloni fra St. 323 ..... 1/1

- 17. *Defrancia lucernaria*, M. Sars. Koloni fra samme sted. seet ovenfra..... 1/1

Fig. 1. *Myrionozoum coarctatum*, M. Sars. Colony from Malangen (found by the author) . . 1/1

- 2. *Menipea normani*, n. sp. Colony attached to a small stone.....1/1

- 3. *Menipea normani*.. Lower part of stem . 17/1

- 4. *Menipea normani*. Part of branch; uppermost avicularium broken off.....60/1

- 5. *Menipea normani*. Back of zoarium, showing origin of chitinous tubes (radical fibres), of which the uppermost runs along the base

of a bifurcation.....60/1

- 6. *Menipea normani*. Back of two zoæcia,  
showing position of lateral avicularia (a) . 60/1

- 7. *Menipea normani*. Mouth of zoæcium, and  
anterior avicularium.....60/1

- 8. *Menipea normani*. Anterior avicularium,  
seen from side . .....100/1

- 9. *Smittia trispinosa*, var. *arhorea*, Levinsen.  
Colony from Station 357 .....1/1

- 10. *Entalophora deflexa*, Smitt. Colony on small  
stone (St. 363).....3/1

- 11. *Entalophora deflexa*, Smitt. Part of a branch 30/1

- 12. *Reticulipora intricaria*, Smitt. Piece of  
zoarium.....1/1

- 13. *Mucronella sincera*. Smitt. Zoæcia of a  
colony from the North Cape.....30/1

- 14. *Mucronella sincera*, Smitt. Zoæcia of co-  
lony from N. Atl. Exp. (place unknown). 30/1

- 15. *Mucronella sincera*, Smitt. Zoæcia of co-  
lony from Hammerfest.....30/1

- 16. *Defrancia lucernaria*, II. Sars. Colony  
from Station 323 .....1/1

- 17. *Defrancia lucernaria*, M. Sars. Colony  
from same place, seen from above ... 1/1Xorsk Nord ha as Expedition.

0.. I ordgaard: Po ly/oa.

Tab. I. Zoologiske Stationer. (Zoological Stations.) Dybde. Apparat. (Apparatus.) S. Skrabe. (Dredge.) T. Trawl,  
s. Svabere (Swabs.) Nordlig Bredde. (North Latitude.) Længde fra Greenwich. (Longitude ) (Depth.) Bundens  
Temperatur. ' (Temperature at bottom.) c. Station No. I )atum. (Date.) Engl. Favne. (Fathoms.) Meter. 1 (Metres')  
Bunden. Bottom. 187 6 i .1 uni 3 6i° 13' 6° 36' E. 65O 1189 6.°6 Sandler. Sabulous Clay. s. 2 (June) 3 61 10 6 32  
E. 672 1229 6. 7 Sandler. Sabulous Clay. T. 4 n 8 61 5 5 14 E. 566 1035 6. 6 Sandler, Grus, Singel. Sabulous  
Clay, Pebbles. T. 8 » 9 61 0 4 49 E. 200 366 6. 6 Ler, Sand, Sten. Clay, Sand, Stones. S. 9 55 20 61 30 3 37 E.  
206 377 5- 9 Ler! Clay. T. 10 11 2 i 61 41 3 19 E. 220 402 6. 0 Slik, Ler. Ooze, Clay. T. i8 11 2 i 62 44 i 48 E.  
412 753 — i. 0 Ler. Clay. S. T. 2.3 11 23 62 52 5 50 E. T. 2 5 11 28 63 10 5 25 E. 98 179 6. 9 Sandler. Sabulous  
Clay. T. S. 26 11 28 63 10 5 16 E. 237 433 7- i Sandler. Sabulous Clay. S. 31 11 29 63 10 5 0 E. 417 763 — i. 0  
Sandler. Sabulous Clay. S. T. 33 11 30 63 5 3 0 E. 525 q6o — i. i Ler. Clay. T. S. 34 Juli i 63 5 0 53 E. 587 1073  
— i. 0 Ler. Clay. T. 35 (July; 5 63 17 i 27 AV. I081 1977 — i. 0 Biloculinler. Biloculina Clay. S. 40 11 18 63 2  
2 5 29 W. 12 15 2222 — 1. 2 Biloculinler. Biloculina Clay. S. T. 48 Aug. 6 64 36 10 22 W. 299 547 — 0. 3  
Morkegraat Lor. Dark-grey Clay. s. 51 5? 7 65 53 7 18 W. I 163 2127 — i- i Biloculinler. Biloculina Clay. S. 52  
11 8 65 47 3 7 \v. 1861 3403 — i. 2 Biloculinler. Biloculina Clay. T. 53 11 10 65 13 0 33 E. I539 2814 — i. 3

Biloculinler. Biloculina Clay. S & T. 5 4 11 12 64 47 4 24 E. 601 1099 — i. 2 Biloculinler. Biloculina Clay. S & T. 60 r 20 6 + 40 9 3° E. I 18 2 16 7- 0 Haardt Lei'. Hard Clay. S. 78 11 2 i 64 48 6 45 E 155 283 7- 0 Sandler. Sabulous Clay. s. 79 2 1 64 48 6 32 E. 155 CC N 6. 9 Sandler. Sabulous Clay. s. «7 11 2 2 64 2 5 35 E. 498 91 I — i. i Ler. Clay. s. 92 „ 22 64 0 6 42 E. 178 326 7- 2 Sandlioldigt Tjor. Sabulous Clay. T. 93 11 24 62 41 7 8 E. 158 289 6. 4 Blodt Ler. Soft Clay. T. (Romsdalsfjord). 1877 96 Juni 16 66 8 3 0 E. 805 I472 — i. i Biloculinler. Biloculina Clay. s. 101 (June) 17 65 36 8 32 E. 223 408 6. 0 Sandler. Sabulous Clay. s. 124 11 19 66 41 6 59 E. 350 640 — 0. 9 Grovkornet Ler. Coarse Clay. S. T. >37 11 2 i 67 24 8 58 E. 452 827 — i. 0 Ler. Clay. S. T. 147 11 22 66 49 12 8 E. 142 260 6. 2 Graat Ler. Grey Clay. S. 149 11 23 67 52 13 58 E. 135 2 47 4- 9 Ler. Clay. T. S. (Vestfjord). 164 11 29 68 2 i 10 40 E. 457 836 — 0. 7 Sandler. Sabulous Clay. S. T. 175 Juli 2 69 17 14 35 E. 415 759 3- 0 Sand. Steno. Sand, Stones. S. .76 C July, 3 69 18 14 33 E. 536 980 — 0. 2 Ler. Clay. S. 177 11 3 69 25 13 49 E. 1443 2639 — i. 2 Biloculinler. Biloculina Clay. S&T. 183 11 5 69 59 6 15 E. 17 10 3127 — i. 3 Biloculinler. Biloculina Clay. S & T. i qo 11 7 69 41 15 51 E. 870 I59I — i. 2 Sandlioldigt Ler. Sabulous Clay. T. I Q2 11 7 69 46 16 15 E. 649 1187 — 0. 7 Sandler. Sabulous Clay. S. 195 11 16 70 55 18 38 E. 107 196 5- i Sten, Ler. Stones, Clay. S. 200 11 17 71 25 15 41 E. 620 1134 i. 0 Ler. Clay. S. T. 205 11 18 70 51 13 3 E. 1287 2354 — i. 2 Biloculinler. Biloculina Clay. S. 213 11 26 70 23 2 30 E. 1760 3219 — i. 2 Biloculinler. Biloculina Clay. s. 223 Aug. i 70 54 8 24 W. 70 128 — 0. 6 Graasort Sandler. Dark-grey sabulous Clay s. (Jan Maye n). 224 11 i 70 51 8 20 W. 95 174 — 0. 6 Graasort Sandler. 1 )ark-grey sabulous Clay s. 225 11 2 70 58 8 4 w. 195 357 — 0. 6 Graasort Sandler. 1 )ark-grey sabulous Clay s. 226 11 2 70 59 7 51 \v. 340 622 — 0. 6 Sort Sand og Ler. Black Sand and Clay. s. 237 11 3 70 41 10 10 \v. 2 63 48: — 0. 3 Brunt Ler, Steno. Brown Clay, Stones. s. 240 11 4 69 2 11 26 w. 1004 1836 1 Biloculinler. Biloculina Clay. s. Station No. Datum. (Date.) Nordlig Bredde. (North Latitude.) Længde Greenwi (Longitm Dybde. (Depth.) .Bundens Temperatur. (Temperature at Bottom.) V, Bunden. Bottom. Apparat. (Apparatus. S. Skrabe (Dredge.) T. Trawl s. Svabere (Swabs.) 11 cl ell. c.) Engl. Favne. (Fathoms.) Meter. (Metres.) 248 Aug. 8 67 56 4 11 E. 778 • 423 -i. °4 Biloculinler. Biloculina Clay. s. 251 „ 9 68 6 9 44 E. 634 1159 — i. 3 Ler. Clay. s. 252 11 Vestfjord. Lor. Cla'v. s. 25 3 » 15 Skjei'stadfjord. 263 481 3. 2 Lor. Clay. s. 253^ » 17 Saltströinmen. 90 165 Sten. Stones. s. 255 1878. Juni i q 68° 12' i5° 40' E. 34I 624 6. 5 Ler. Clay. s. (Vestfjord). 257 (June) 2 i 70 4 23 2 E. I 60 293 3- 9 Ler. Clay. s. (Altenfjord). Ler. Clay. 258 » 21 70 13 23 3 E. 230 421 4- 0 T. (Altenfjord) Clay. S. T. 260 „ 24 70 55 26 11 E. I27 232 3- 5 Ler. (Porsangerfjord). 261 » 25 70 47 28 30 E. I 27 232 2. 8 Ler. Clay. S. T. (Tanafjord). 262 „ 27 70 36 32 35 E. 148 271 i. 9 Ler. Clay. T. S. 267 „ 29 71 42 37 i E. 148 271 — i. 4 Ler, Sten. Clav. Stones. s. 270 » 30 72 27 35 i E. I36 249 — 0. 0 Ler. Cla'v! S. 273 Juli i 73 25 31 30 E. I97 360 2. 2 Ler. Cla'v. S. 275 (July) 2 74 8 31 12 E. I47 269 — 0. 4 Ler. Clay. T. 280 4 74 10 18 51 E. 35 64 i. i Sten. Stones. S. (Boeren Eiland). 283 5 73 47 14 21 E. 767 1403 — i. 4 Ler. Clav. s. 286 „ 6 72 57 14 32 E. 447 817 — 0. 8 Ler. Clay. T. 2QO 7 72 27 20 51 E. 191 349 3- 5 Sandler. Sabulous Clay. T. 2 95 „ 14 71 59 11 40 E. 1110 2030 — i. 3 Biloculinler. Biloculina Clay. T. 2 97 „ 16 72 36 5 12 E. 1280 2341 — t. 4 Biloculinler. Biloculina Clay. T. 303 » !9 75 12 3 2 E. 1200 2195 — i. 6 Biloculinler. Biloculina Clav. T. 312 » 22 74 54 14 53 E. 658 1203 — I. 2 Ler. Clav. T. 315 „ 22 74 53 15 55 E. 180 329 2. 5 Ler, Sand. Clav. Sand. T. 322 „ 23 74 57 19 52 E. 2 i 38 0. 2 Haard. Hard. S. T. 323 » 30 72 53 2 i 51 E. 223 408 i. 5 Ler. Clay. 326 Aug. 3 75 31 17 50 E. 123 22 5 1. 6 Ler. Clay. T. 333 » 4 76 6 13 10 E. 748 1368 — i. 3 Biloculinler. Biloculina Clay. T. 336 n 5 76 19 15 42 E. 70 128 0. 4 Ler, Haard B. Clav, Hard Bottom. s. 338 r 6 76 16 17 49 E 146 267 — i. i Sten. Rock. s. 343 ,7 7 76 34 12 51 E. 743 1359 — i. 2 Ler. Clay. T. 35° 8 76 26 0 29 \V. 1686 3083 — i. 5 Biloculinler. Biloculina Clay. T. 353 „ IO 77 58 5 10 E. 1333 2438 — i. 4 Biloculinler. Biloculina Clav. T. 357 „ >2 78 3 11 18 E. 125 229 i. 9 Ler. Clav. „s. 359 „ 12 78 2 9 25 E. 416 761 0. 8 Ler. Clay. 362 » 14 79 59 5 40 E. 459 839 — i. 0 Ler. Clay. T. 363 » 14 80 3 8 28 E. 260 475 i. i Ler. Clay. T. (366 „ 17 79 35 11 17 E. 61 112 — 2. i Ler. Clay. T. i » Magdalene Bay. 37 68 — 0. 2 370 „ 18 78 48 8 37 E. 109 199 i. i Ler. Clay. T. 372 „ 19 78 9 14 7 E. 129 236 i. 2 Ler. Clay. T. (Isfjord). 374 9 ? » 78 16 15 33 E. 60 110 0. 7 Ler. Clay. T. (Advent Bay).Dpil Norske Nordli(tvs-Exgedition.

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Zoological. Stations.

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1876—1878.  
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K. F. KÖHLER.  
XXVII.  
ZOOLOGY.  
P O L Y Z O A.  
BY  
O. NORDGAARD.  
WITH 1 PLATE AND 1 MAP.  
CHRISTIANIA.  
PRINTED BY GRØNDAHL & SØN. 1900.  
LONDON,  
SAMPSON, LOW, MAESTON, SEARLE & RIVINGTON.  
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